

# The Canadian Medical Association Journal

Vol. XXIX

TORONTO, AUGUST, 1933

No. 2

## BRITISH PIONEERS IN THE MODERN TREATMENT OF TUBERCULOSIS\*

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IT is perhaps well to refer first to the two pioneer protagonists of the open-air treatment of tuberculosis—George Bodington in 1840 and Henry MacCormac from 1855 to 1883—as neither of them is mentioned in Piéry and Roshem's *Histoire de la Tuberculose* (1931), in which under the heading of "Les precurseurs de Brehmer" the rather surprising statement is made that Florence Nightingale is generally regarded as having been the first to grasp the idea of fresh air and over-feeding. Bodington is noticed in Garrison's *History of Medicine* and in Castiglioni's *History of Tuberculosis*, but not in the *Dictionary of National Biography*, and MacCormac's life is given in the *Dictionary of National Biography*, but he is not mentioned in Garrison's *History of Medicine*, or in Castiglioni's *History of Tuberculosis*. It should, however, be mentioned that William Black (1749-1829) of London, in his *Observations, Medical and Political, on the Small-pox*, Lond., 1781, wrote: "Seeing that such multitudes die of consumption in London and knowing that pure air is at least equal to diet or medicines in this direful distemper, would not two or three hospitals, built for consumptives, at a few miles distance from London, save hundreds of lives annually?" This suggestion, which he did not follow up, fell on stony ground and did not attract any attention.

### GEORGE BODINGTON

George Bodington who was born in 1799 came of an old yeoman family in Warwickshire. Educated at Magdalen College School, Oxford, he was apprenticed first, when seventeen, to a surgeon at Atherstone, and a year later to one

in London where he attended the practice of St. Bartholomew's Hospital. Qualifying L.S.A. at the Society of Apothecaries in 1825, he practised at Erdington, a village near Birmingham, until 1843 when he devoted his whole time to the management of the Driffold House Asylum, Sutton Coldfield, of which he had become proprietor in 1836; he kept on this work until 1868. In March, 1843, he obtained the degree of M.D. Erlangen, and in 1859 became L.R.C.P. Edinburgh. He was described in his obituary notice as "not a silent member of the profession. . . a man of strong opinions. . . an ardent protectionist, never wavering in his faith, and ever earnest in advocating the theories in which he believed." His first medical publication was a letter addressed to the President and Council of the Central Board of Health in 1831 on "The Treatment of Asiatic Cholera by Sulphuric Acid" in which he most vigorously condemned the current antiphlogistic treatment by bleeding, calomel, and low diet, of acute disease, and was thus early in this reform. He also returned to this subject in 1866 when cholera again invaded Great Britain, in an article on the theory and treatment of cholera (*Brit. M. J.*, 1866, 2: 368). His independent and outspoken opinion was prominent in this as in his advocacy of the open-air treatment of tuberculosis. He also wrote on "The Plea of Insanity" in connection with the Townley Case (*Brit. M. J.*, 1864, 1: 300), "The Disposal of Sewage, and Sanitary Improvement by the Double Circulatory System" (1872), and a short letter on "Anæsthetics" (*Lancet*, 1873, 1: 32), so that he covered a fairly wide field. His death occurred on February 5, 1882, at Sutton Coldfield.

In 1840 he brought out "An Essay on the

\* Read at the annual meeting of the Canadian Medical Association, Saint John, June 21, 1933.

Treatment and Cure of Pulmonary Consumption on Principles, rational and successful. With Suggestion for an improved Plan of Treatment of the Disease among the lower Classes of Society; and a relation of several successive Cases restored from the last Stage of Consumption to a good State of Health." It was published by Messrs. Longmans of London, and was reprinted, with a memoir from the *British Medical Journal* (1882, 1: 361), by the New Sydenham Society in a

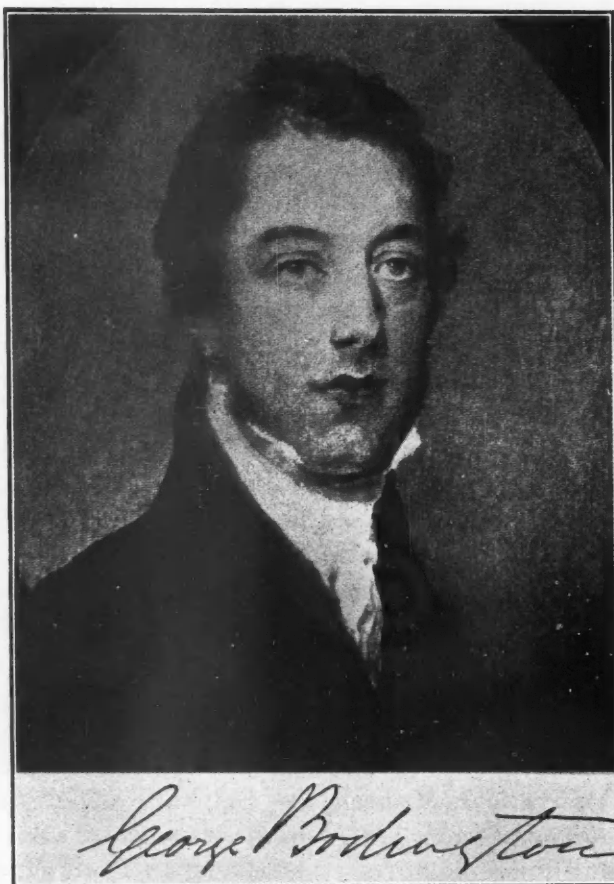
volume of "Selected Essays and Monographs" in 1901. The most important element in Bodington's treatment was to live in the open air, by walking if the patient was able to do so, otherwise by riding or driving in a carriage. He did not mention sleeping out of doors, but insisted that the rooms should be airy, cool, and at a temperature about that in the open, the body being kept warm by sufficient clothing. Not only did he strongly condemn the popular close-room treatment with every effort to exclude the access of the open air, thus "forcing

them to breathe over and over again the same foul air, contaminated with diseased effluvia of their own persons," but he inveighed against the "meagre diet of vegetables, rice and water aided by tartarized antimony," and "the antiphlogistic treatment which directly impairs and destroys the powers of nutrition." He recommended a nourishing diet of fresh meat and farinaceous food with a proper quantity of wine, but he did not stand up for "the beef-steak and porter system" which Sir James Clark (1788-1870), the author of "A Treatise on Pulmonary Consumption" (1835) which was mainly a compilation, had rather sarcastically criticized. He recorded five

torium treatment, namely the reception of patients in a house under a medical man's supervision, and described the regime which he carried out in a house near his own.

The rationale of the treatment was in his own words "to preserve or restore to a normal condition the functions of the nervous filaments interwoven with the substance of the lungs, and exercising influence over the capillary system and other parts of the organization." This result he contended would follow the inhalation of cool fresh air, a good diet, and sedative drugs. He rather deprecated sea-air, and in this connection reference

may be made to Richard Russell (1687-1759) who in 1750 was the first to recommend sea water for enlarged lymphatic glands, and has recently been called by Dr. C. Häberling "the Father of Marine Treatment"; this lead was followed by the establishment in July, 1791, of the "Margate Infirmary for the Relief of the Poor whose Diseases require Sea-Bathing," which in 1898 changed its name to the Royal Sea-Bathing Hospital. The famous quaker physician John Coakley Lettsom (1744-1815) took an active part in starting this hospital. It may also be mentioned that Ebenezer Gilchrist (1707-1774) of Dumfries, having fortified himself with the opinions of Aretaeus and other medical Fathers, warmly advocated sea voyages for consumption in 1756.



Bodington's essay received short and slashing shrift from the reviewers; the *British and Foreign Medical*

*Review* (1840, 10: 549), the most authoritative medical journal at that time, said that it betrayed "utter ignorance of pathology, therapeutics and the English language," and professed to be pained by this elaborate advertisement of his establishment for tuberculous patients. The *Lancet* (1839-40, 2: 575), edited by the redoubtable Thomas Wakley (1795-1862), referred to "his very crude ideas and unsupported statements," and added that "his theory of pulmonary consumption is altogether novel, and far above the range of our limited powers of comprehension." With our present and superior knowledge it is easy to agree that the final sentence with its mock modesty was nearer the truth than the reviewer meant or

imagined. Bodington never returned to the subject, being thus unlike MacCormac who from 1855 to 1883 was constantly writing and speaking on the cure and prevention of consumption by fresh air.

#### HENRY MACCORMAC

Henry MacCormac was born at Fairlawn in County Armagh, Northern Ireland, in 1800 as the second son of Cornelius MacCormac of the Royal Navy. After working in Dublin, Paris, and Edinburgh where he graduated M.D. in 1824, he travelled widely for several years in Africa and the United States of North America. After settling in Belfast he was appointed physician to the General Hospital (1828-1836) and professor of practical medicine, in the Medical Department of the Belfast Academical Institution (1835-1849). In 1832 he successfully treated the victims of the cholera epidemic; like Bodington he was also interested in the insane, and as physician to the Belfast District Lunatic Asylum greatly improved the sanitation and the diet of its inmates so that in another epidemic of cholera they escaped without any fatality. After a very active professional life he gave up practice about 1866 to devote himself entirely to writing. He died on May 26, 1886, in Belfast.

MacCormac was the second and the most persistent advocate of "pure, fresh, untainted air, at all hours, at all times and in all places." On many occasions he played the part with enormous energy of a prophet preaching to those who would not listen; in 1861 he proclaimed that "there can be no immunity from the two-fold scourge of phthisis and scrofula until medical practice and popular conviction concur alike as to the indispensableness of fresh air," and added that he would never rest satisfied with less than a general assent to his views. He was so whole-heartedly a believer in the truth and importance of what he was urging that his failure to convert medical opinion is pathetic. Though with a very wide acquaintance with literature, as the numerous references in his books amply prove, and said to be at home in at least twenty languages, he never referred to Bodington unless the first twelve words in the following somewhat lengthy sentence do so obliquely:—

"I am not the first to proclaim the advantages of fresh air, but I am the very first to assert the efficacy of unbreathed air, the first to proclaim that phthisis is the result of the unoxidised carbonaceous materials accumulating in the blood, and their deposit as the structureless, amorphous substance, hitherto known under the designation of tubercle" (1861).

But probably he meant Baudelocque (1834), Fourcault (1844), Richard Carmichael (1810) of Dublin and others whom he elsewhere quotes to the effect that scrofula is due to foul air. He drew a distinction between foul air and previously respired air, the latter of which he incriminated. He denied that tuberculosis was due to infection or was hereditary, and referred with a touch of pride to his "happy inference (in 1855) that the arrest or invasion (*sic*) of the natural order of the metamorphic changes, because of rebreathed air, hindering or suspending, first, the oxidation, then, the expulsion of the effete carbonaceous waste, was in reality the direct and only origin of tubercle." In 1865 in the second edition of his book (p. 28) he wrote: "The law of respiration, then, MacCormac's law since I claim to have discovered it, subsists alike from the equator to the pole, extends to all breathing kind. *Wherever the air habitually respired has been respired, in whole or in part, before, there, tubercular deposits are found, and wherever the air habitually respired has not been respired, in whole or in part, before, there, tubercular deposits are impossible and consumption and scrofula are unknown.*" He argued that expired air does not contain sufficient oxygen to burn off the "carbonaceous waste," and correlated imperfect ventilation with pulmonary tuberculosis as the result of numerous clinical observations and information gathered from many countries about the incidence of tuberculosis and the conditions of life. In addition, though he did not appear to lay great stress on them, he submitted to the Académie Impériale de Médecine, Paris, in 1855 the results of experiments on dogs—those kept in an ill-ventilated atmosphere became tuberculous in six weeks, whereas the controls remained healthy. His hypothesis that tuberculosis was due to the retention of carbohydrate waste resembles the view that imperfect excretion of uric acid and disordered protein metabolism are responsible for gout; and in his paper on "Carbonæmia, the immediate Source of Tubercle" (1867), MacCormac referred to the analogy. That false hypotheses or premises may lead to

correct conclusions is well recognized; for example, S. N. L. Carnot (1796-1832), the French physicist, deduced the law of thermic action from an hypothesis as to the nature of heat subsequently shown to be erroneous. MacCormac's advocacy of fresh air, open windows at night and vigorous condemnation of the superstition that night air is harmful, deserve full recognition now, especially as they received very little encouragement at the time.

In connection with modern views it is interesting to consider his attitude to the question of rest and exercise in the treatment of tuberculosis. Exercise, especially on horseback, had been advocated by Sydenham (1624-1689), the British Hippocrates, and by Benjamin Rush (1747-1813), the "American Sydenham" or the "Hippocrates of Pennsylvania."

MacCormac recommended exercise in the open air solely as a means of increasing the aeration and entrance of oxygen into the lungs, and mentioned with approval rowing and the use of a swing. But exercise unless in the open air he regarded as worse than useless as prone to cause exhaustion. He advocated a full diet including milk, and protection against undue cold when lying out in the open air. He refers to the work of F. H. Ramadge (1793-1867) who from 1834 onwards advocated as a cure for consumption the inhalation of ordinary air through a tube which, while admitting air freely, offered a slight obstruction to its egress and thus secured full inflation of the lungs; this was with the object of producing emphysema to compress the vomicae and so bring about their healing. Thomas Beddoes (1760-1808) founded the Pneumatic Institute at Clifton in 1798 for the investigation of the medicinal uses of "factitious" air, the two principal being oxygen and hydrocarbonate, a mixture containing hydrogen and carbonic acid. It was here that Humphry Davy (1778-1829) in 1799 discovered the anæsthetic properties of nitrous oxide, much the most important work accomplished there. It may be mentioned that pulmonary tuberculosis was among the various diseases for which the inhalation of oxygen was recommended by S. B. Birch in 1857.

MacCormac stuck tenaciously to his convictions and had a way with him; for example he enforced his directions about open windows by poking his umbrella through the window panes

of recalcitrant patients. It is perhaps too much to expect that Koch's discovery of the tubercle bacillus in 1882 should have converted this sturdy octogenarian to the infective nature of tuberculosis; he certainly did not give in, and published an open letter to Dr. Wilson Fox (1831-1887) saying that the bacilli were the result and not the cause of the pulmonary disease; the title page of this brochure on the "Etiology of Tubercle with Comments on Dr. Koch's Bacilli" (1882) bore on it the following:

"What is consumption, the bacillus,  
What is the bacillus, consumption,  
But what causes consumption, why the bacillus,  
And what causes the bacillus, consumption to be sure."

Q. E. D.

Chorus of possible  
supporters of Dr. Koch.

#### PUBLISHED WORKS

*On tuberculosis.*—In a paper, read to the Statistical Section of the British Association at Belfast on September 7, 1852, "On the Connection of Atmospheric Impurity with Disease" he "ventured to assert" that consumption could not ensue among those who live in the open air, and in his book "Moral-Sanatory Economy" (1853) he emphasized this again. In 1855, a year notable for the appearance of Thomas Addison's monograph "On the Constitutional and Local Effects of Disease of the Suprarenal Capsules," and for Claude Bernard's conception of the internal secretions, MacCormac brought out "The Nature, Treatment and Prevention of Pulmonary Consumption, and incidentally of Scrofula, with a Demonstration of the Cause of the Disease." It was dedicated to James Copland (1791-1870) who, according to Norman Moore, wrote more on medicine than any fellow of the Royal College of Physicians of London of his own or any previous time. MacCormac's book of 111 pages was published by Messrs. Longmans who had brought out Bodington's *Essay* in 1840, and were still engaged on Copland's "Dictionary of Practical Medicine" (1832-58), the pages of which if laid out in succession would extend for nearly a mile (N. Moore). MacCormac, when his book was very adversely reviewed in the *Lancet* (1855, 2: 473), expostulated in its pages, and the reviewer replied with the button off his foil. MacCormac for his part did not forget, but waited before he returned to the charge for a considerable interval, until 1872.

His book was reviewed in three columns in the *Dublin Medical Press* (1855, 34: 325) and a lengthy exception was taken to his statement that cod-liver-oil is useless in the treatment as it does not contain any active principles or ingredients of any kind. Earlier in this year MacCormac sent a copy of his book to the Académie Impériale de Médecine, Paris, with a letter submitting his claim as the discoverer of the true cause of tuberculosis and of the only rational mode of treatment; it was not, however, until May 5, 1858, that the Académie on the proposal of Velpeau referred it to Barth and Cloquet who do not appear ever to have presented a report. The book was translated into German and Dutch. A second edition appeared in 1865 and was dedicated to his elder son, the famous Sir William MacCormac (1836-1901); its title was altered to "Consumption, as engendered by rebreathed Air and consequent Arrest of the unconsumed carbonaceous Waste, its Prevention and possible Cure," and as an introduction of a hundred pages and eight new addresses were added it is practically a new book. It is an eloquent and moving appeal to abolish tuberculosis as the author, who was in deadly earnest, firmly believed could be done by following his directions.

His essay "Tubercle and its Genesis" was read in his absence before the Edinburgh Medico-Chirurgical Society on May 20, 1856. At the Royal Medical and Chirurgical Society of London on April 23, 1861, MacCormac's paper on the "True Nature and Absolute Preventibility of Tubercular Consumption" was read in his absence by the secretary, E. H. Seiveking (1816-1904), under the chairmanship of B. G. Babington (1794-1866) whose father William Babington (1756-1833) had also been president of this, the then premier medical Society. The proceedings at the meeting were not reported in the *British Medical Journal*, but the *Lancet* (1861, 1: 434) shows that the first speaker characterized the reading of the paper as waste of time; another said that the Society should be protected from having to listen to such productions, and a third that the substance of the paper was five hundred years old, and that no proof had been forthcoming of his theory which had wasted the time of the meeting. Finally the meeting, which was attended by 31 fellows and 5 visitors, pointedly declined to pass a vote of thanks to the author. The paper was printed

in abstract in the *Proceedings*, but was not considered worthy of the *Transactions* of the Society, a fate also meted out to some of the earlier papers in 1857-8 on Addison's disease, though not by Addison, and to Samuel Gee's paper pointing out splenic enlargement in congenital syphilis in 1867.

Not unnaturally this rebuff rankled and in an address on the same subject delivered on the following June 5 to the Medical and Pathological Society of Ulster, MacCormac remarked "Mankind, in respect of discoveries, are just as children are with bitter physic . . . Tell a physician, could we only revive him, of some three hundred years syne, to believe that blood, not air, coursed through the arteries. Or, lastly, invite the Medico-Chirurgical Society of London, or rather the few who, on a late occasion so complacently assumed to represent it, to endorse my views on tubercle." More than twenty years later (1883) he published an open letter on "The Air Cure of tubercular Consumption as conducted at Davos and the Engadine," addressed to "The Medico-Chirurgical" reminding them of their verdict and calling upon the Society to acknowledge that his contentions had now been proved to be correct. The minutes of the Council of the Royal Medical and Chirurgical Society for 1883 do not contain any reference to the letter. Nothing daunted by his reception in London in 1861 he proceeded on October 27, 1862, to address a meeting of 29 fellows and 2 visitors at the Medical Society of London on the "Preventibility of tubercular Consumption." The contents of this paper abstracted under 26 headings appeared in the second edition (1865) of his book on consumption, but the minutes of the meeting do not give any indication of what the speakers in the subsequent discussion said.

In 1872 he brought out another book "Consumption and the Air rebreathed, being a sequel to the Author's Treatise on Consumption" which contained two papers presented to the British Medical Association's Annual Meetings at Dublin (1867) and Oxford (1868), the first of these on "Carbonæmia, the immediate cause of Tubercle" is not mentioned in the *British Medical Journal*, but the second one on "Tubercle and the Crucial Test" was reported (*Brit. M. J.*, 1868, 2: 571).

*Medical subjects other than tuberculosis.—*

His first book in 1828, four years after he had taken his M.D. degree at Edinburgh, was a "Treatise on the Cause and Cure of Hesitation of Speech or Stammering; as discovered by Henry MacCormac, M.D., London," pp. 112. The proximate cause of stammering or stuttering, for which he sometimes used the unfamiliar synonym *psellismus*, of Greek derivation, is the attempt to speak when the air in the lungs is exhausted and the lungs are nearly collapsed; the remedy, described in detail, is to speak only during expiration. Optimistically he believed that in a few years confirmed stuttering would have ceased to have any but historical interest in Europe and America.

In 1832 when Belfast was in the throes of the cholera epidemic MacCormac did great service in taking charge of the cholera hospital, and wrote on its treatment by dilute acids; in 1849, when cholera was again epidemic, he brought out "Directions for the Management of Cholera in the Absence of Medical Advice," 2nd Edition, in which he relied on laudanum in the early stages as a means of cutting short the disease, and at a later stage calomel in addition to laudanum; acids are not mentioned in this brochure, but in 1874 in a pamphlet "How to preserve Health on the Gold Coast," dedicated to the memory of his brother John, of Sierra Leone, he recommended half a drachm of dilute sulphuric acid as a prophylactic. Like Bodington, who also recommended sulphuric acid, he wrote on cholera, so much in evidence a century ago, and also on lunacy; in *Metanoia, a Plea for the Insane*, Lond., 1861, a short pamphlet of sixteen pages, he stated that insanity is not a disease of the brain substance but that "the evil lies in quite other than empirical considerations, resides in the mind's unconsciousness of its consciousness, in a word the soul's unawareness of its own acts," an anticipatory echo of Freud and later psychology. He does not define otherwise what the word *metanoia* means.

His *Exposition of the Nature, Treatment and Prevention of Continued Fever*, Lond., 1835, dedicated to Elliotson, Graves and Alison, contains the following remarkably prophetic expression of opinion: "Is it not extraordinary that no Ministry of public health exists of which medical men should form a part? If the community had the same faith in the preventive as in the saving power of medicine—and it

surely merits at least equal confidence—such a function as the above would soon be called into existence." Otherwise the earliest advocacy in this country appears to have been that in 1854 by Sir John Simon (1816-1904), which was recommended by the Royal Sanitary Commission appointed in 1869. It was not until 1919, 84 years after MacCormac's book, that the Ministry of Health was established. His insistence on preventive medicine was much in advance of his day; he returned to this subject in a small volume entitled "Moral-Sanatory Economy" (1853), and also wrote a pamphlet on the open-air treatment of fevers. In 1842 he brought out *Methodus Medendi or the Description of the principal Diseases incident to the human Frame*, London, Longmans, pp. 574. In it he advises four hours daily in the fresh air as a prophylactic against tuberculosis, thus anticipating by thirteen years the opening of his long campaign against pulmonary consumption.

It is noteworthy that in 1864 he put forward a plea for "The Painless Extinction of Life in Animals designed for human Food," and that in 1930 and 1933, nearly seventy years later, a bill was brought forward by Lt.-Col. T. G. R. Moore in Parliament to introduce into England the mechanical killer in place of the barbarous methods of the poleaxe and the knife; this mechanical killer, which produces unconsciousness before slaughter, was adopted in Scotland and Northern Ireland before 1933.

*Subjects other than medical.*—MacCormac's extraordinary activity is shown by his output of books on aspects of life other than those of a strictly medical character; this was maintained to the end of his life, for at the time of his death he had in preparation for publication manuscripts on philology and insanity.

The following are his non-medical works: (1) "On the best Means of Improving the Condition of the working Classes," Lond., 1830. (2) "The Philosophy of human Nature in its physical, intellectual and moral Relations; with an attempt to demonstrate the Order of Providence in the three-fold Constitution of our Being," pp. 564, Lond., 1837. (3) "The Meditations of Marcus Aurelius Antoninus with the Manual of Epictetus and a Summary of Christian Morality." Freely translated from the original Greek, pp. 126, Lond., 1844. (4) "Moral-Sanatory Economy," pp. 150, Lond., 1853; (besides the medical aspects previously

mentioned, this work dealt with prostitution, education, employment, progress and competence). (5) "Aspirations from the inner, the spiritual Life, aiming to reconcile Religion, Literature, Science, Art with Faith, and Hope, and Love, and Immortality," pp. 370, Lond., 1860. (6) "On Synthesis as taking Precedence of Analysis in Education," Lond., 1867. (7) "The Conversation of a Soul with God, a Deodicy," Lond., 1877. (8) "Moral Secular Education for the Irish People versus ultra-montanist Instilment," Lond., 1879. (9) "The Irish Priest."

For much information about his grandfather I am indebted to Henry MacCormac, Physician to the Skin Department, Middlesex Hospital, London.

#### JOHN HUGHES BENNETT

John Hughes Bennett (1812-1875), a Londoner by birth, was brought up medically in Edinburgh under the influence of the famous anatomist Robert Knox (1791-1862) and John Fletcher (1792-1836) the physiologist, and then spent some years abroad. Returning to Edinburgh in 1841, full of energy and imported ideas, he at once published a "Treatise on Cod-liver-oil as a therapeutic Agent in certain forms of Gout, Rheumatism and Scrofula" which later involved him in a wordy warfare with C. J. Blasius Williams (1805-1889), physician to University College Hospital, London, who was afterwards described as "the cock-sure physician." Bennett's knowledge about cod-liver-oil had been acquired in Germany, but it had long been used by the fisher folk in Scotland and also in Manchester where Thomas Percival (1740-1804) advocated it in 1789; Bennett's advocacy, however, greatly increased its consumption, it is said from one gallon to 600 gallons a year in the sales of one firm alone. It has been stated that he was one of the pioneers of the open-air treatment of pulmonary tuberculosis; in a small book on the pathology and treatment of pulmonary tuberculosis (1853) Hughes Bennett does not refer to Bodington and very cautiously to open-air treatment; he recommended that the patient should "pass a few hours every day in the open air" and stated that its advantages depend on "exercise and on the stimulus given to the nutritive functions rather than to its influence on the lungs directly." Elsewhere

he recommended a nutritious diet, "consisting of a good proportion of animal food abounding in fat," and, to stimulate the appetite, exercise "whether on foot, horseback, or in a carriage where the patient is protected from cold winds." Like Bodington in 1831, he in 1857 did good service by opposing bleeding, mercury and antiphlogistic measures generally, which had been the fashion in the acute fevers, tuberculosis and pneumonia to combat the inflammatory processes. From 1841 he taught microscopical anatomy, pathology and clinical medicine, first as an extra-mural teacher and later as pathologist and physician to the Royal Infirmary and professor of the Institutes of Medicine. He broke new ground by his classes in histology, a knowledge of which he had acquired in Paris. In 1845, simultaneously with Virchow, he described under the name of "hypertrophy of the spleen and liver" the blood in leukæmia or, as he and the Edinburgh school after him termed it, leucocythæmia. He had set his heart on the chair of Medicine, but in 1855 he was beaten after a close contest by T. Laycock (1812-1876) of the York provincial school of medicine. His failure was probably partly due to want of kindly tact and to his habit of frank criticism of his colleagues, and unfortunately embittered the rest of his life. He died twenty years later at Norwich after an operation for stone by William Cadge (1822-1903) who later in the *Lancet* gave an account of the "cock-sure physician" already mentioned.

It is a curious coincidence that several medical men of the same name have been prominent in the study of tuberculosis: Christopher Bennet (1617-1655) wrote one of the early books on pulmonary consumption "Theatri Tabidorum Vestibulum" (1654) and died of this disease. In the preface to the English translation "Theatrum Tabidorum or the Nature and Cure of Consumption" (1720) it is said that he "was naturally consumptive and with difficulty supported under it for many years together; so that he had not only great opportunities of being thoroughly acquainted with this disease from a long practice, but from a long experience of what passed within himself. Thus instructed, all his acquaintance, and the most eminent of the faculty in particular, were desirous for his writing upon the subject, and the following work seems to have been extorted from

him by their opportunities." His Latin style was somewhat careless and difficult, and it is reported that Boerhaave "in some pleasant intervals with his pupils" spoke of him as "the Dealer in Heteroclitēs" (nouns declined otherwise than in the ordinary manner).

John Henry Bennet (1816-1891), a London gynaecologist, was attacked by pulmonary tuberculosis in 1849, but being a good fighter he determined not to die, and accordingly lived largely on the Riviera. In a pamphlet on the treatment of pulmonary tuberculosis (1866) he remarked "theoretically the value of pure air—of atmospheric food—is universally accepted by the medical profession; practically it is all but universally neglected," and while insisting on the importance of rest spoke of some patients who had "walked themselves to death." He finally retired from London in 1875, and died on July 28, 1891.

James Risdon Bennett (1809-1891) was one of the first to introduce the use of the stethoscope in this country; he was appointed physician to the City of London Hospital for Diseases of the Chest when it opened in 1848, was physician to St. Thomas's Hospital, and was president of the Royal College of Physicians of London from 1876 to 1881.

#### ARTIFICIAL PNEUMOTHORAX

Like fresh air, the other recent advance in the treatment of pulmonary tuberculosis, artificial pneumothorax was advocated long before it was adopted in practice. Piéry and Roshem quote the recommendation, ascribed by others to Ebenezer Gilchrist (1707-1774) of Dumfries, to make an opening into the affected side of the chest and induce collapse of the lung. But reference to the first edition of his "Use of Sea Voyages in Medicine" (1756) does not confirm this; he, it is true, mentioned the advantage of "procuring an easier circulation through the lungs," of making "a due compression on the tender blood-vessels," and stated that "a seton in the side has done considerable service." Baglivi (1669-1707) in 1696 reported the cure of a tuberculous soldier by a penetrating wound of the chest, and recommended incision of tuberculous cavities, as did Sir Edward Barry (1698-1776) in 1726. This was carried out by Benjamin Bell (1749-1806), "the first of the Edinburgh scientific surgeons," in 1778, and by Henry Marsh, Stokes, and a Welshman

named Thomas about 1830 (Hastings; Godlee). The first case of resection of the ribs to bring about obliteration of a cavity was published by de Cérenville in 1885.

James Carson (1772-1843), "Physician in Liverpool," in a paper on "The Causes of Vacuity of the Arteries after Death" in 1821, and again in the following year in an essay on lesions of the lungs, described the experimental production of pneumothorax and collapse of the lung. In the second paper he considered the effects which might be produced in some diseases of the chest by collapse of one lung or of both lungs in succession. He then suggested, but did not say that he had performed, this operation for pulmonary tuberculosis and for hæmoptysis. Carson's advocacy was based on his discovery of the elasticity of the lungs (1820) which has often been ascribed to Donders twenty-five years later. In 1885, apparently without any knowledge of Carson's work, William Cayley (1836-1916) of the Middlesex Hospital argued that collapse of the affected lung, by greatly reducing the amount of blood circulating through it, would afford a fair prospect of arresting hæmoptysis; his patient, who had recurrent hæmoptysis, survived the operation of opening the pleural cavity and inserting a tube, performed by J. W. Hulke (1830-1895), for five days; the necropsy showed that adhesions had prevented complete collapse of the lung and that there was generalized miliary tuberculosis. In 1888 Potain brought before the Académie de Médecine of Paris three patients in whom he had induced artificial pneumothorax by the repeated introduction of nitrogen. In 1882 Carlo Forlanini (1847-1918) of Pavia advocated, and in 1894 practised, artificial pneumothorax; this was the starting of the treatment in which C. Saugman (1864-1923) of the Vejle fjord Sanatorium also played a pioneer's part. C. Lillingston, who in 1909 after two years of febrile pulmonary tuberculosis had artificial pneumothorax induced at the Mesnalian Sanatorium in Norway by Dr. Holmboe, performed it in the following year on a patient in the Mundesley Sanatorium, Norfolk, and wrote papers on the subject. In 1911 there were records of 200 authentic cases in which it had been performed, and after this it became generally practised in Great Britain. In 1922 Burrell and MacNalty gave an authoritative review of the subject. The more modern

surgical procedures of phrenic evulsion and thoracoplasty are based on the same principle of collapsing the affected lung and so giving it rest. These operations have been specially practised in Great Britain by Morriston Davies.

In 1877 Sir Clifford Allbutt, who in 1866 had treated typhus fever at Leeds by open air with great success, visited Davos as the travelling companion of John Addington Symonds (1840-1893) who on Allbutt's advice spent most of the rest of his life there; Allbutt then wrote on Davos as a residence for consumptives. In 1887 Robert Philip started a tuberculosis dispensary in Edinburgh, and as a result of his energy the Victoria Hospital there was opened in 1894. A few private sanatoriums now began to appear, for example at Bournemouth and Cromer, somewhat tardily following the lead of Brehmer at Görbersdorf in Silesia (1859), Trudeau in the Adirondacks (1884), and Walther at Nordrach.

A rapid advance dated from 1898 when Malcolm Morris (1849-1924) with the assistance of StClair Thomson started a crusade against tuberculosis, and was supported by leaders of the profession, such as Samuel Wilks, William Broadbent and Hermann Weber. A meeting was held in December of that year at Marlborough House, and the Prince of Wales lent his support with the slogan "If preventible why not prevented," became the President of the National Association for the Prevention of Tuberculosis then founded, and took an active part in connection with King Edward VII Sanatorium at Midhurst which was opened in 1906. In November 1899 James Kingston Fowler introduced a discussion on the open-air treatment of tuberculosis which occupied three days at the Royal Medical and Chirurgical Society which was the phoenix-like predecessor of the present Royal Society of Medicine (1907). At that discussion the President (Thomas Bryant, 1828-1914) described the treatment by the "constant fresh-air bath of surgical tuberculosis," and Alfred Pearce Gould (1852-1922) pointed out that "the open-air treatment of which we now hear so much, is not a novelty, but has been the surgeon's sheet-anchor in dealing with tubercle for many years, albeit under simpler conditions than pertain in special sanatoria, without forced feeding, often without regulated exercises, and always without that latest æsthetic refinement, rectal temperatures." Later on he added "Medical men even have much to learn

in this way. It is rather depressing to pass down Harley Street or Wimpole Street on an early summer morning and looking up, to see nearly every bedroom window tightly closed." This surgical activity in the open-air treatment has, like that of W. S. Halsted in 1905, (which, however, A. K. Krause has rescued from undeserved neglect) been rather overlooked. In 1908 Lord Mayor Treloar's Cripples' Hospital and College at Alton, Hampshire, was opened with Henry Gauvain as its most successful Medical Superintendent and developer.

The colony or settlement system for tuberculous men and women convalescent after sanatorium treatment meets a great want by supplementing and making really effective the benefit obtained by treatment in a sanatorium. Beginning in a very small way during the later years of the war Pendrill Varrier-Jones has built up Papworth into a community of about a thousand, consisting of patients in the sanatorium and hospital and of the permanent colonists, amongst whom there are about a hundred families. Those able to work do so under medical supervision in the Papworth Industries and thus earn a livelihood, are relieved from anxiety about the future, and are happy in their self-respect. The Papworth Industries with a yearly turnover of more than £72,000 are a great success. Similar village settlements have been established at Barrymore Hall, Cheshire, Preston Hall, Kent, and Peamount, near Dublin.

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ELECTROCARDIOGRAPHIC STUDIES OF THE DYING HEART IN  
ANGINA PECTORIS

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**E**LECTROCARDIOGRAMS taken during attacks of angina pectoris are relatively rare, and tracings of the dying heart during one of these attacks extremely rare. The author wishes to report electrocardiographic observations of a heart before, during, and after a fatal attack of angina pectoris. Such a report has not hitherto been published. The interest of this report is enhanced by the fact that it was possible to correlate certain physical findings with those of the electrocardiograms of the dying heart. The various physiological changes which took place in this dying heart are also of definite interest. The diagnosis of angina pectoris was confirmed by autopsy.

Electrocardiographic studies of angina pectoris, particularly those of Fogelson and Willius, have shown that the cessation of cardiac function is not simultaneous with clinical death. Further, the process of the dying of the heart is not identical in all cases. In the case reported here, clinical death was evident before complete cessation of the myocardial contractions. Whether or not the heart sounds are demonstrable during ventricular fibrillation has been of interest to many cardiologists. In this instance, heart sounds were demonstrable for at least three minutes following ventricular fibrillation.

The general changes which took place in the electrocardiogram at the very beginning of the attack could not be demonstrated, as the attack had started before it was possible to get the electrodes applied and the machine started. The electrocardiographic findings during this first attack were the development of an auricular fibrillation, more inversion of the T waves, and frequent premature ventricular systoles arising apparently from the same focus. Q.R.S. complexes become notched, the Q.S. interval markedly widened, and an impure auricular flutter was noted momentarily. The premature ventricular systoles then became more frequent and variable in their place of origin. The attack subsided, but the electrocardiogram did

not return to normal. The auricular fibrillation persisted, the premature ventricular systoles were very frequent (arising from multiple foci), and the Q.S. interval very markedly increased. There was also a coarse somatic tremor demonstrable. A bradycardia developed; the rate was 43. The ventricular rhythm was more regular.

Suddenly a second attack started, and by the time the electrocardiogram could be taken, the heart was in ventricular fibrillation. The ventricular waves gradually became smaller in amplitude and more rounded until almost a straight line was recorded. This line suddenly dropped below the iso-electric level, after which no auricular or ventricular complexes were demonstrable. A number of the smaller waves seen on the electrocardiogram, and believed to be ventricular in origin may have been due to certain electrical changes which were taking place in the body generally.

## CASE REPORT

The man, a machinist 49 years old, was admitted to the Robert Packer Hospital on June 1, 1930. He complained of belching of gas, shortness of breath on exertion, and attacks of epigastric distress. During the preceding two years he had noticed some slight dyspnoea on exertion, and had been subject to attacks of epigastric distress which did not necessarily follow exertion or food, and had occasional spells of regurgitation of sour material from his stomach. He felt as if the upper abdomen were bloated and filled with gas, and because of this, breathing was slightly difficult. For relief, he had used alkalies, ginger and whiskey. Occasionally he would belch gas, then feel more comfortable. On several occasions he had vomited during the attacks. He described the latter attacks as rather suffocating in nature, and he had become apprehensive for his safety during the attacks.

In one of the later attacks, his attending physician was called to see him, and believing it to be a gall-bladder attack, administered a hypodermic. These attacks lasted from five to thirty minutes, and became more frequent and severe. Although exertion had contributed to a number of the more recent attacks, several occurred during the night, and a number also while the patient was sitting quietly. There was occasional nocturia.

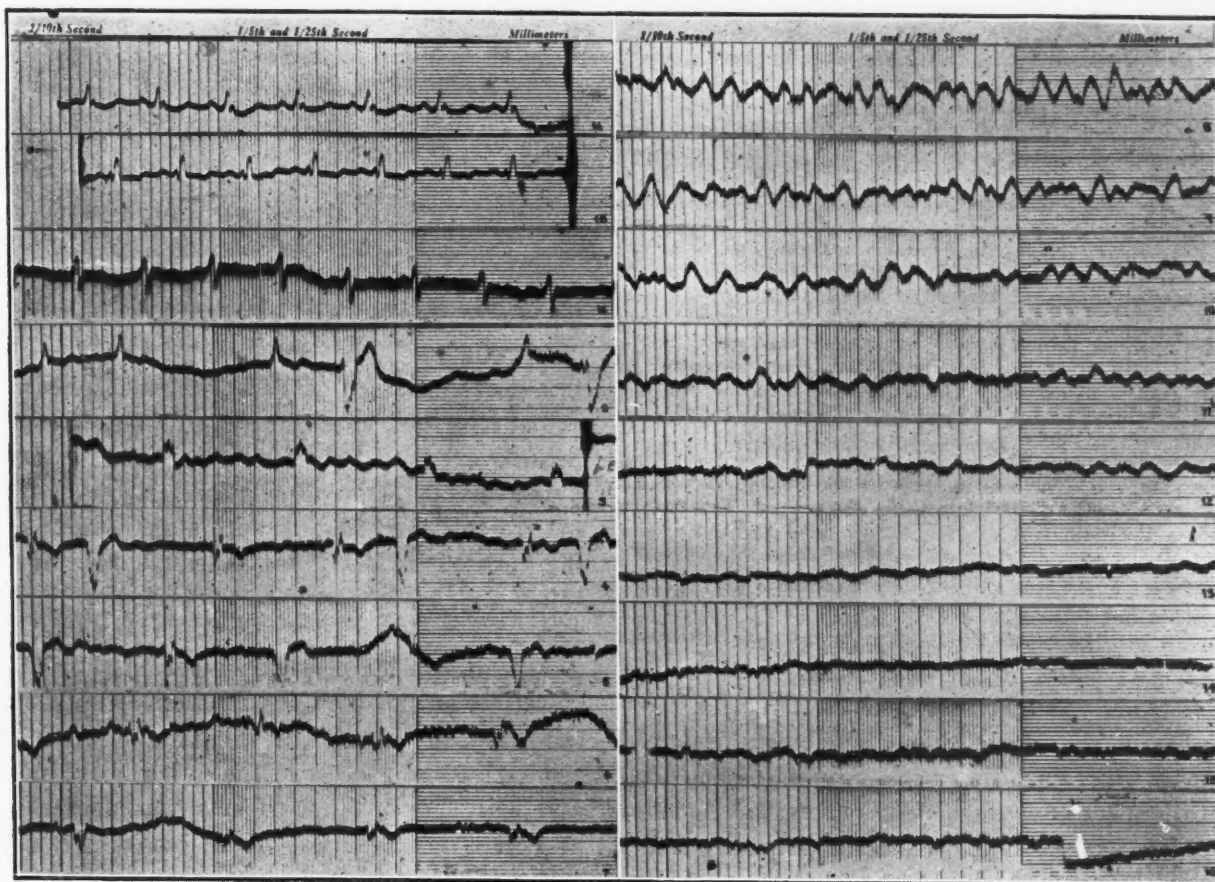
There was no history of syphilis, rheumatic fever, influenza, scarlet fever, or pneumonia. The patient smoked cigarettes excessively and used alcohol habitually but moderately. He could recall no instances of cardiovascular disturbance in his family.

When first seen, the patient was lying in a recumbent position, apparently without discomfort, was

slightly pale, with no cyanosis and no evidence of jaundice. The tonsils were large and diseased. The glandular system was normal. The chest was resonant throughout. The lungs were essentially normal. The heart was apparently normal in size. The apical impulse was in the fifth interspace, 10.5 cm. to the left of the sternum. There was moderate tachycardia; the rhythm was suggestive of the gallop type. The first sound at the aortic area was slightly muffled. Heart sounds other than this were clear. The systolic blood pressure was 130, the diastolic pressure 86. The blood vessels showed a slight degree of thickening. The liver was palpable one fingersbreadth below the costal margin

and there was a general tenderness in the right epigastrium. All reflexes were slightly exaggerated. Roentgen examination of the kidneys, ureters, and bladder revealed a large, low-lying right kidney, but aside from this showed nothing abnormal.

The blood count on June 1st showed 9,900 white blood cells (75 per cent polymorphonuclears and 25 per cent lymphocytes). The blood urea was 43 mgrm. per 100 c.c. of blood. The Kahn test was negative. Fractional gastric analysis was essentially normal. The urine was of a variable specific gravity with a moderate daily output averaging 900 c.c. There were, constantly, a few pus cells in the urine.



- FIG. 1a, b, c.—Electrocardiogram taken the day prior to the fatal attack. (Fig. 1a, between right and left arms; Fig. 1b, between right arm and left leg; Fig. 1c, between left arm and left leg.)
- FIG. 2. Lead I.—Beginning of first attack tracing shows more inversion of T wave, slight increase in amplitude of Q.R.S. Auricular fibrillation. Frequent premature ventricular systoles arising apparently from the same focus.
- FIG. 3. Lead II.—One minute later. Q.S. interval much increased. Impure auricular flutter.
- FIG. 4. Lead III.—One minute later. T waves inverted. Frequent premature ventricular systoles. Auricular fibrillation. Q wave down 3.5 m.v.
- FIG. 5. Lead III.—Five minutes after attack began. Every second ventricular complex is a premature ventricular systole—apparently arising from multiple foci.
- FIG. 6. Lead III.—Attack subsided. Still marked inversion of T waves. Coarse somatic tremor. Auricular fibrillation. (Between right and left arms.)
- FIG. 7. Lead III.—Ten minutes after attack subsided. Bradycardia—rate 43. No P wave. Rhythm more regular.
- FIG. 8. Lead II.—Attack started suddenly. Ventricular fibrillation.
- FIG. 9. Lead II.—One minute later. Nitroglycerin given.  
\* Note diminished amplitude of waves.
- FIG. 10. Lead II.—One minute later. Amplitude of waves decreased. Complexes generally more rounded.
- FIG. 11. Lead II.—One minute later. Diminished amplitude waves.
- FIG. 12. Lead II.—Five minutes after attack began. Diminished amplitude waves.
- FIG. 13. Lead II.—Seven minutes after attack began. Waves of extremely low amplitude.
- FIG. 14. Lead II.—Eight minutes after attack. No P waves demonstrable.
- FIG. 15. Lead II.—Eight minutes after attack. Adrenalin given into heart muscle.  
\* Note return of small waves. Clinical death diagnosed.
- FIG. 16. Lead II.—At 9 minutes, waves disappearing.  
\* Note sudden drop below iso-electric level after which no waves are demonstrable.

The patient was put to bed at absolute rest. The heart rhythm returned to a normal sinus rhythm, and the patient seemed to gain in strength daily. On June 10, he was permitted up in a chair for ten minutes, and stood the activity well. The next day, activity was increased to twenty minutes in a chair. On June 12th, he complained of some burning in the epigastrium, and had a sensation that he would like to belch gas, but was unable to do so. He did not appear to be in great distress, and asked for bicarbonate of soda.

As the electrocardiograph was immediately available, it was decided to take an electrocardiogram. The patient was given some nitroglycerin and the electrocardiographic machine turned on to lead I. The patient's condition seemed to get progressively worse in spite of the nitroglycerin. Leads II and III were then taken. The distress became extreme, and precordial pain radiated down the left arm. The patient came out of this attack stating that he felt much better. He said that this attack had been the most severe he had ever had, and that the pain simulated very much that of his previous attacks.

The electrodes were left attached to his body with the hope, of getting a tracing following the attack. Unfortunately, the pain suddenly returned, more severe in nature than before. The patient lapsed into unconsciousness and the extremities became cold and moist. More nitroglycerin was given. He grew worse very rapidly, and passed away. Adrenalin was given intramuscularly prior to death, with the effect as noted on the electrocardiogram. The times noted on the film are not absolutely exact, but are approximately correct. In order not to lose any time, no effort was made to shift the leads during the fatal attack. The resultant film contained an electrocardiogram of the patient before an attack, during a severe attack, during an interval in which the pain and discomfort subsided markedly, and during the second attack which ended with the patient's death.

An autopsy was granted. A careful examination was made of the heart. The pathological report showed that there was considerable fatty tissue in the mediastinum which was removed before exposing the pericardium. The pericardium was not thickened. There was no fluid nor was there evidence of inflammatory reaction. The heart was of approximately normal size with a slight hypertrophy of the right ventricle. Both coronary arteries showed a moderate degree of arteriosclerosis, but no recent infarctions of the muscle could be found either by macroscopical examination or complete section of the heart. The valves and endocardium were essentially normal. The lungs were essentially

normal, and showed no evidence of pulmonary thrombosis or infarction. The examination of other organs failed to reveal any significant pathological disturbance, and the pathological diagnosis was coronary sclerosis, which was accentuated at the orifice of the descending branch of the anterior coronary artery. There was also a moderate degree of general arteriosclerosis.

#### SUMMARY

A case history and complete electrocardiographic findings have been presented of a patient during an attack of angina pectoris, during the cessation of this attack, and during a sudden and fatal second attack, the graph continuing through and after the patient's death. The diagnosis of angina pectoris was confirmed by autopsy.

In this case, the cessation of the auricular function was noted early; changes then became evident in the ventricular complexes, the heart became extremely irritable, the patient finally dying of ventricular fibrillation. It was possible to hear the heart sounds, with a stethoscope over the apex of the heart, for at least three minutes following the origin of the ventricular fibrillation.

A study of the electrocardiogram shows that cessation of the cardiac function is not simultaneous with clinical death, but follows this. In comparing the process of the dying heart in this case with that of other reports, we find that the process is not identical in all cases. Cessation of function precedes chemical changes, and until these changes take place, it is possible by stimulation to get a return of cardiac function. This, no doubt, explains the beneficial effect of adrenalin injections after clinical death, in a number of such cases reported.

Clinical death does not coincide with chemical or physiological death.

**EFFECT OF THEELIN INJECTIONS ON THE CASTRATED WOMAN.**—In their experimental study with theelin on five women, A. A. Werner and W. D. Collier observed that theelin restores the breasts and genital tract of women to apparently the normal sexual state after previous castration atrophy. Theelin produces changes in the atrophied endometrium of castrated women that approximate or equal the interval changes found in the normal women at the time of ovulation. Theelin does not produce the pregravid changes in the endometrium of castrated women. The bleeding from the uterus of castrated women induced by theelin occurs from an endometrium approximating or equaling in development the interval changes found in the uterus of normal

women. Theelin induces bleeding from the uterus of castrated women qualitatively indistinguishable from menstruation in normal women. This bleeding from the uterus of castrated women is accompanied by the subjective symptomatology usually experienced by normal women during menstruation. Theelin relieves the subjective symptoms that occur in women following castration. The four ovariectomized women to whom the authors gave large doses of theelin stated that "libido was markedly increased." Excessive doses of theelin were given to women intramuscularly over a period of from 89 to 93 days without seeming discomfort, until a dosage of from 6 to 8 c.c. daily was reached.—*J. Am. M. Ass.*, 1933, 100: 633.

## THE BLOOD PRESSURE AND BLOOD VESSELS IN CEREBRAL ARTERIOSCLEROSIS

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CEREBRAL arteriosclerosis appears to be increasingly common, both relatively and actually, in relation to other conditions which produce psychoses. Pollock<sup>1</sup> has shown that in State Hospitals in the State of New York psychosis with cerebral arteriosclerosis has been constantly increasing, whereas other mental disorders are increasing very slightly or not at all. It is perhaps to be expected that as man lives to the fifth, sixth and seventh decades cerebral arteriosclerosis should become more common. It is also believed that the unusual increase in this disorder is due to strenuous mental and physical activity. There are men and women who at this time increase their worry and anxiety, and perhaps indulge in other excesses, when it is reasonable to assume that the individual should be living a somewhat less active life than in earlier decades. While overwork, worry and alcohol are still considered to be important etiological factors in producing this disease, the last named factor assumes much less importance than was formerly attached to it. Many persons suffering from cerebral arteriosclerosis have been abstainers from alcohol, or have used it very sparingly. If alcohol is used to excess by a person who has also worked and worried to excess arteriosclerosis is more likely to result than when alcohol has not been used. Not all instances of cerebral arteriosclerosis are accompanied by mental symptoms, at least to the extent where special mental hospital care is indicated, but statistics do prove that in relation to other mental disorders it is becoming one of the most common and serious forms of mental derangement.

The symptoms which bring these patients to our mental hospitals are similar to those occurring in most organic brain diseases, *viz.*, increasing difficulty in adjustment to environment, owing to irritability, confusion, loss of memory and failing judgment. Until recent years it

was thought that psychosis due to cerebral arteriosclerosis always showed focal signs, but many cases are now diagnosed which do not show focal signs, and in which the onset is very insidious and the development slowly progressive in the mental sphere, without definite focal or physical signs. A fairly large number of cases begin more or less abruptly following cerebral hæmorrhage, and extensive brain injury follows immediately after the hæmorrhage. While perhaps most persons who suffer from a cerebral hæmorrhage may largely recover their mental capacity, others remain confused, with definitely impaired memories and less acute reasoning faculties.

During recent years there have been a number of patients in the sixth and seventh decades of life, for the most part men rather than women, whose psychosis begins with severe depression and hypochondriasis, but who show some of the physical and mental characteristics of advanced arteriosclerosis. It has been our experience that, as time progresses, the depressive symptoms in these individuals become less marked and the cerebral arteriosclerotic symptoms become more evident, and that eventually such can scarcely be distinguished from other cases of cerebral arteriosclerosis in which the illness did not begin with depressive symptoms. It is our opinion that such cases should be differentiated on admission from depressions of the manic-depressive group, and should be regarded from the outset as arteriosclerotic depressions. The prognosis in this group has been invariably unfavourable, making the differential diagnosis of considerable prognostic importance.

In view of the increasingly important part that cerebral arteriosclerosis is playing in the development of mental disease any findings that will be of value in its diagnosis are of extreme importance. In this regard we are concerned

with (1) the condition of the retinal arteries, (2) the condition of the brachial and radial arteries, and (3) the blood pressure. In an attempt to throw some light upon the value of these findings, 26 patients at the Ontario Hospital, Whitby, who were suffering from psychosis due to cerebral arteriosclerosis were examined. This condition occurs almost entirely in persons over 50 years of age, a period when some degree of arteriosclerosis is considered not unusual. Thus, to give us some idea of the normal findings in this age period, a similar study was carried out on a control group. The nearest approach to normal that could be readily obtained were other patients in the hospital. For this purpose it was decided to use schizophrenic patients, and they were so chosen that for each patient with cerebral arteriosclerosis there was a control of the same age and sex.

*The retinal arteries.*—Arteriosclerotic changes in these arteries are gradual, and there is no place where a line can be drawn so as to say that all arteries on one side are normal and all on the other side arteriosclerotic. However, to be of value, we must have some definite changes which can be considered as evidence of arteriosclerosis. Retinal vessels that show either (1) tortuosity of the smaller branches or (2) slight dilatation of a vein beyond where it is crossed by an artery were considered arteriosclerotic. It is appreciated that these are evidences of moderately advanced arteriosclerosis. However, they are changes which are definite and that can be recognized with a small amount of practice. The earlier changes of arteriosclerosis are indefinite and require a large amount of practice to be able to recognize them. At best they are largely dependent upon personal opinion and are common findings in persons over 50 years of age. In the 26 patients with psychosis due to cerebral arteriosclerosis 72 per cent showed the above described changes in their retinal vessels. In the control group only 12 per cent showed these changes. These figures, as to the frequency of retinal arteriosclerosis in patients with clinically evident cerebral arteriosclerosis, check closely with the findings of other workers.

Wagener,<sup>2</sup> in a study of 27 cases of cerebral arteriosclerosis with clinical manifestations, found evidence of retinal arteriosclerosis in 74 per cent of cases. Moore,<sup>3</sup> in a similar study

of 46 cases, found retinal arteriosclerosis in 70 per cent of cases. Gunn,<sup>1</sup> in a study of 17 cases, found retinal arteriosclerosis in 60 per cent.

This problem has been attacked from another point of view. Moore<sup>3</sup> studied a group of 46 patients in whom the complaint was a disturbance of vision due to retinal arteriosclerosis. He could demonstrate cerebral arteriosclerosis clinically in 46 per cent of these patients. Wagener,<sup>2</sup> in a similar study, could demonstrate cerebral arteriosclerosis in 18 per cent of his patients. Agatston<sup>4</sup> goes as far as to say that sclerosis of the arteries of the brain or kidney cannot exist without similar changes in the retinal arteries.

*The brachial and radial arteries.*—It has been a clinical tradition to look upon the presence of peripheral arteriosclerosis as evidence of a similar change in the vessels of other parts of the body. From the pathological point of view there is considerable evidence to show that this is a false conception. Klotz<sup>5</sup> points out that in the arteriosclerosis of peripheral arteries the lesion is a degeneration fibrosis and calcification of the medial coat. The development of this type of sclerosis bears some relation to the amount of physical work done by the individual. The type of arteriosclerosis found in the vessels of the brain is an overgrowth of the intima obstructing the lumen. These changes are much like those found in the coronary arteries, and they bear no relation to the medial sclerosis of peripheral arteries. Dow,<sup>6</sup> from a study of the arteries from eight bodies over fifty years of age, concluded that the distribution of the arteriosclerosis throughout the body is variable, and its presence in one artery is no indication of its presence in another. In the investigation of the state of the peripheral arteries by palpation the findings are influenced somewhat by the amount of tissue overlying the artery. To overcome this, and to eliminate the personal factors, the state of the radial artery was studied by x-ray. This method of investigation is only of value when the moderately advanced stage of calcium deposition in the media is reached. It was found that the radial arteries of 27 per cent of the patients with psychosis due to cerebral arteriosclerosis and 19 per cent of the control group were visible by x-ray. By this investigation it is seen that peripheral arteriosclerosis is slightly more common in patients with psychosis due

to cerebral arteriosclerosis than among a control group. However, it is a relatively infrequent finding in the former patients, and the difference between the two groups is not great. For these reasons, along with those given by the pathologists, it is felt that the condition of these arteries could be of little aid in the diagnosis of cerebral arteriosclerosis.

**The blood pressure.**—Most writers consider that there is some relationship between cerebral arteriosclerosis and hypertension. Some look upon hypertension as the cause and others the result of cerebral arteriosclerosis. Whichever of these views is true, the height of the blood pressure should be an aid in the diagnosis of

each other fairly closely. The curves for the diastolic blood pressures are similar to those of the diastolic.

#### SUMMARY OF RESULTS

	Patients with psychosis of cerebral arteriosclerosis	Control group
Arteriosclerotic retinal arteries	72% of patients	12% of patients
Sclerosis of one radial artery, as shown by x-ray	27% of patients	19% of patients
Average systolic blood pressure	140 mm. Hg.	135 mm. Hg.
Average diastolic blood pressure	78 mm. Hg.	74 mm. Hg.

#### CONCLUSIONS

Keeping in mind the number of cases studied, the following conclusions can be drawn.

1. The condition of the retinal arteries is a valuable aid in the diagnosis of cerebral arteriosclerosis. However, the absence of retinal arteriosclerosis does not definitely exclude this diagnosis, nor does the finding necessitate it absolutely. An idea of the value to be placed on the finding of retinal arteriosclerosis can be gained from the fact that it is present in 72 per cent of cases with cerebral arteriosclerosis and only in 12 per cent of a control group.

2. The condition of the peripheral arteries and the level of the blood pressure is of no value in the diagnosis of cerebral arteriosclerosis.

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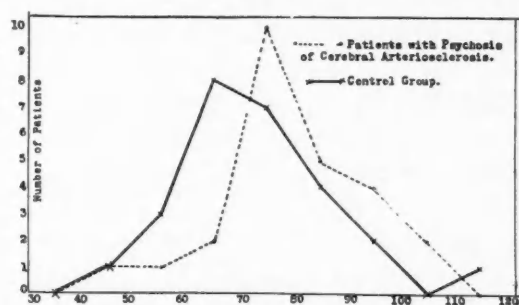


CHART I.—Diastolic blood pressure mm. Hg., distribution curve.

cerebral arteriosclerosis. This hypothesis is not borne out by our findings. The average blood pressure for the patients with psychosis due to cerebral arteriosclerosis is 140/78, and that of the control group is 135/74. This close approximation of the average for the two groups is supported by a study of the frequency curve drawn from the results obtained (see Chart). It will be seen that the curves obtained for the diastolic pressures of the two groups simulate

**FILAMENT-NONFILAMENT COUNT IN CHRONIC ARTHRITIS: AN AID IN THE DIFFERENTIATION OF RHEUMATOID ARTHRITIS AND OSTEO-ARTHRITIS.**—In their studies of the chronic rheumatic diseases O. Steinbrocker and E. F. Hartung resorted to various aids to facilitate the diagnosis and differentiation of chronic rheumatoid arthritis and osteo-arthritis. Because infection is considered the etiological factor in some forms of these diseases, they have for some time sought diagnostic assistance from the study of the blood picture. They observed that the filament-nonfilament count is a useful routine diagnostic aid in chronic arthritis. Filament-nonfilament counts in fifty patients with rheumatoid or chronic infectious arthritis were abnormally elevated in 100 per cent of

the patients. The filament-nonfilament count was normal in 26 patients, or 52 per cent, of a group of osteo-arthritic patients, while in the rest of this group the count was elevated. The average nonfilament count was much higher (31.5 per cent) in patients with rheumatoid arthritis than in osteo-arthritic patients with an abnormal count (22.3 per cent). The filament-nonfilament count is helpful in differentiating rheumatoid arthritis from osteo-arthritis only when within normal limits. A normal count indicates that chronic rheumatoid infection is not present. An elevated count may indicate the presence of rheumatoid arthritis, mixed rheumatoid and osteo-arthritis, or osteo-arthritis with active focal infection.—*J. Am. M. Ass.*, 1933, 100: 654.

## AGRANULOCYTOSIS\*

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BROWN,<sup>1</sup> in 1902, reported a fatal case of acute primary infectious pharyngitis with extreme leukopenia. Schultz,<sup>2</sup> in 1922, reported five cases under the heading "Gangrenous processes and injury of the granulocytic system." These patients all had gangrenous and ulcerative stomatitis, gingivitis, tonsillitis, pharyngitis and laryngitis in various combinations. There was absence or great diminution of granulocytes in the circulating blood. The highest white cell count was 1,800. At autopsy the only finding of note was the great diminution of granulocytes and myelocytes in the bone marrow. Death occurred in from three days to two weeks. Schultz concluded that far-reaching lesions of the bone marrow occurred which resulted in a marked loss of tissue resistance. To this syndrome he applied the term "agranulocytosis," and he is largely responsible for the present interest in the condition. Friedemann,<sup>3</sup> in 1923, reported similar cases which he called "agranulocytic angina." David<sup>4</sup> preferred the term "granulocytopenia." Recently Roberts and Kracke,<sup>5</sup> have adopted the abbreviated term of "granulopenia," based on analogy with such terms as "leukopenia" and "thrombopenia."

Jackson, Parker and Taylor<sup>6</sup> use the term "agranulocytic angina" to cover cases of Schultz' syndrome, and employ the term "malignant neutropenia" to cover those cases in which extreme leukopenia has followed a definite septic process, such for instance as pneumonia or pansinusitis. Piersol and Steinfeld<sup>7</sup> believe that the syndrome described by Schultz merits the term "primary granulopenia," and that instances with discoverable cause and corresponding to his original description should properly fit into this category. They state "that this premise would rest on a sounder basis if it were possible to lay down certain criteria in the same manner in which

one now distinguishes pernicious anæmia from secondary anæmia. The term secondary granulopenia seems appropriate for the larger group of cases due to known causes."

They suggest the following as a satisfactory classification:

<i>Primary Granulopenia</i>	<i>Secondary Granulopenia</i>
(a) Acute (Schultz)	(a) General infections; influenza; typhoid; some exanthemata; sepsis, etc.
(b) Chronic (recurrent)	(b) Focal infection.
	(c) Chemical (arsphenamine, benzene).
	(d) Irradiation (x-rays, radium).
	(e) Blood diseases (leukæmia, splenic diseases, aplastic anæmia, etc.).

With reference to chronic recurrent agranulocytosis (primary granulopenia) Rutledge, Hansen-Pruss and Thayer<sup>8</sup> describe cyclic granulocytic angina, associated with fever and constitutional symptoms, but without anæmia, beginning at the age of two and one-half months and recurring at intervals of approximately three weeks during the entire life of a man 20 years of age, at that time a university student.

In June, 1927, Kastlin,<sup>9</sup> of the Department of Pathology of the University of Toronto, made an excellent review of the literature of 43 previously reported cases and added 2 cases, one in a female, the second in a male, with complete autopsy reports. His report with reference to the bone marrow is as follows "The bone marrow which in the gross appeared red, on microscopic examination was cell-poor, with an almost total absence of granulocytic cells and a predominance of lymphocytes and endothelial cells. Endothelial hyperplasia was present in the spleen and lymph nodes."

Doan reports the mortality statistics of malignant neutropenia (agranulocytosis) under various forms of treatment as follows:

\* Read before the Winnipeg Medical Society, on January 20, 1933.

	Cases	Mortality	
		Deaths	per cent
Untreated .....	Many	—	90
Miscellaneous therapeutic measures	178	133	74
Arsphenamine .....	33	24	72
Blood transfusion .....	53	34	64
Irradiation .....	64	34	53
Nucleotide .....	44	11	25

Reznikoff<sup>10</sup> treated 4 cases of agranulocytosis with intravenous injections of the purine bases adenine and guanine along with blood transfusion; 3 recovered. Jackson, Parker and Taylor<sup>6</sup> report 69 cases adequately treated cases with pentose nucleotide K96. Of these, 54 cases were typical primary agranulocytoses, 38 (70 per cent) recovered and are well to date. Seven of these cases relapsed after a period of weeks or months but again responded as before to a second treatment with nucleotide K96. In the secondary cases due to sepsis equally favourable results were achieved. The authors recommend the following treatment. Ten c.c. (equivalent to 0.7 grm. of the solid), should be injected intramuscularly twice a day until the white blood cell count has very definitely risen; 10 c.c. should then be given intramuscularly once a day until the white blood cell count has been essentially normal on at least three consecutive days. Thereafter the patient should be watched for a possible relapse. In certain resistant cases an increase over the usual dose brought a marked increase of white blood cells, after smaller doses had produced little or no effect. An increase in the leucocyte count or in the number of polymorphonuclear cells does not as a rule appear

before the fifth day after treatment has begun, and no marked clinical improvement should be expected before this time.

The following is a summary of the clinical and laboratory data on four cases of agranulocytosis, two of which were observed at the Children's Hospital, Winnipeg.

CASE 1

A. B., a female, aged six years, was referred to one of us (G.C.) by Dr. Charles Hunter on December 21, 1931, with the following blood count, as reported by Dr. O. C. Trainor: red blood cells, 2,840,000; hæmoglobin, 65 per cent; colour index, 1; white blood cells, 2,050. The differential count suggested to Dr. Trainor the diagnosis of aplastic leukæmia.

She was admitted to the Children's Hospital on December 22, 1931, with the following complaints: weakness, loss of weight, disturbed sleep, poor appetite, frequent nose bleeds, and pallor since May, 1931. She was an only child, having been breast-fed seven months. Since weaning there had been great difficulty in having her eat vegetables and other solids, so that her diet consisted largely of milk. There had been no other illnesses other than whooping-cough at one year of age and measles at four years.

Examination on admission showed a thin girl with a marked pallor and decided caries of all teeth. The tonsils were inflamed and a moderate cervical adenopathy was present; otherwise examination was negative. Her red blood count was 3,100,000, with 60 per cent hæmoglobin. The white blood count was 4,000, with 26 per cent polymorphonuclears, 62 per cent lymphocytes, 9 per cent monocytes, and 1 per cent eosinophiles. The platelets were normal. On the third day after admission she was discharged with the diagnosis of nutritional anæmia.

She was re-admitted 5 weeks later with additional complaints of unwillingness to play, constipation, shortness of breath, and occasional puffiness of the legs. She was pale, and her skin was smooth and white. The gums were soft, spongy and bled easily. During the first night the rectum prolapsed following an enema. The red cell count was now 1,900,000, with 30 per cent of hæmoglobin, and the red cells showed moderate anisocytosis and poikilocytosis. No nucleated red cells were seen, and no polychromatophilia was present. The white cells were 1,520, with polymorphonuclears 39 per cent, lymphocytes 54 per cent, and monocytes 7 per cent.

TABLE I

Date	White blood cells	No. of polymorphonuclears	Polymorphonuclears per cent	Lymphocytes per cent	Monocytes per cent	Red blood cells	Hæmoglobin per cent	Remarks
Feb. 5	3,350					3,160,000	67	
Feb. 8	3,250	975	30	64	6			New forms of polymorphonuclears are present.
Feb. 10	3,000	1,080	36	60	4			Platelets decreased; cells of bonemarrow origin present (4 per cent). Polymorphonuclears, 20 per cent young forms, 16 per cent mature.
Feb. 11	3,400	1,836	54	44	2	3,270,000	62	Very immature forms of polymorphonuclears seen (43 per cent).
Feb. 14	4,800	2,544	53	45	2	3,210,000	68	Polymorphonuclears 43 per cent young, 10 per cent mature forms. Anisocytosis, polychromatophilia, reticulocytes 4.5 per cent, platelets in creasing.

The platelets were single and in small clumps. Her bleeding time was  $5\frac{1}{2}$  minutes.

A direct transfusion of 400 c.c. of whole blood was given. The liver was found to be 3 fingerbreadths below the costal margin, 4 days after admittance. A smear of the gums showed Vincent's organisms in large numbers, and treatment with metaphen, sodium perborate, and peroxide was instituted. Her temperature, which had been between  $103^{\circ}$  and  $104^{\circ}$  for the first four days dropped to normal and stayed so until her discharge ten days later. A Widal test was negative, but a blood culture was positive for *Staph. aureus*, probably a contamination.

She was put on iron and copper medication, with

the addition of ventriculin. Her appetite improved so that she consumed everything put before her; her mouth cleared, and her blood picture steadily improved, as shown in Table I.

A diagnosis of neutropenia was made on discharge.

She was re-admitted 6 days later with a fever of two days' duration. Examination now showed a fine papular rash on both legs, and teeth that had crumbled away to a gum margin. Left cervical adenopathy was present, and the liver was  $1\frac{1}{2}$  fingerbreadths below the costal margin. A mouth smear was positive for Vincent's organisms. In spite of all this she felt and ate well. She was put on iron and copper medication again, with the addition of hydrochloric acid. She

TABLE II

Date	White blood cells	No. of polymorphonuclears	Polymorphonuclears per cent	Lymphocytes per cent	Mono-cytes per cent	Red blood cells	Hæmoglobin per cent	Remarks and Treatment
Feb. 21	1,450	1,058	73	27	—	2,380,000	47	Young forms of polymorphonuclears 4.5 per cent, old forms 68.5 per cent. No normoblasts seen. Poikilocytosis and polychromatophilia.
Feb. 22	1,150	322	28	70	2	2,490,000	49	Anisocytosis, platelets markedly decreased.
Feb. 23	1,675	603	36	64	—			
Feb. 24	2,100					1,860,000	35	No reticulocytes seen in 4,000 cells counted; serum bilirubin 0.2 mgrm. per 100 c.c. Blood culture was negative. 0.3 gm. of adenine sulphate was given intravenously in 20 c.c. of normal saline.
Feb. 25	2,200	1,166	53	47	—	1,230,000	20	Poikilocytosis. No polychromatophilia. No normoblasts. No reticulocytes. 530 c.c. of whole blood by direct transfusion. Diagnosis—aplasia of the hæmatopoietic system.
Feb. 29	4,400					3,290,000	51	Large polychromatic red cells. A few nucleated forms.
Mar. 1								60 c.c. of whole blood, with 5 c.c. of Lederle liver extract given intravenously.
Mar. 2	2,400	1,296	54	44	2	2,970,000	52	Basophilic colouring. Macrocytes and occasional nucleated forms. Myelocytes 2 per cent young forms, 22 per cent old; polymorphonuclears 30 per cent.
Mar. 3	2,900	1,508	52	38	10	3,480,000	54	80 c.c. citrated blood intravenously with 3 c.c. of Lederle's liver extract.
Mar. 6	2,800					4,080,000	59	
Mar. 7								80 c.c. citrated blood intravenously, with 3 c.c. of Lederle's liver extract.
Mar. 10	2,350	1,081	46	48	6	3,970,000	63	Macrocytes. Increased number of platelets. Polychromatophilia and normoblasts. Large number of reticulocytes. 3 c.c. of liver extract given intravenously.
Mar. 13	3,850					4,170,000	73	The cells are of more uniform size. Normoblasts and megakaryoblasts are present. Platelets still more plentiful. Reticulocytes 2.2 per cent. 3 c.c. of liver extract given intravenously.
Mar. 17	4,700	2,068	44	38	18	4,510,000	82	This smear would pass as normal if the history were not known. 3 c.c. of liver extract given intravenously.

did splendidly, gained weight and strength, and in three and one-half weeks took a few steps about the room. The changing blood picture and details of treatment can best be gathered from Table II.

March 19th. The left ear was found to be discharging. This marked the turning point in the case. The temperature began to rise higher and higher, and became swinging in type. Periodontal abscesses were discovered 4 days later. The white blood count fell from 4,700, with 44 per cent polymorphonuclears on March 17th, to 1,200, with 15 per cent polymorphonuclears on March 27th, in spite of all attempts to protect and stimulate the hæmatopoietic system with repeated blood transfusions and intravenous injections of liver extract. Ten days later there was definite evidence of mastoid involvement. Dr. James McGilivray operated, and found the mastoid honeycombed and filled with pus. Blood and 10 per cent glucose were given intravenously, and the temperature dropped to 97°. Twenty-four hours later the left side of the neck began to swell and became tender to touch. This area spread from the wound margins down to the side of the face, under the chin, and down to the front of the chest. At its commencement it had been termed cellulitis, but was now definitely diagnosed as erysipelas. As a culture from the wound had shown streptococci, antistreptococcal serum was given. The quartz lamp was used locally. The girl became irrational and looked quite toxic. Blood culture now showed streptococci. On April 4th she died. The following Table (see Table III) shows the effect of the infection on the hæmatopoietic system.

CASE 2

H. B., a female, aged five years, was referred to one of us (G.C.) by Dr. MacKinnon, of McGregor, Man., and was admitted to the Children's Hospital on January 19, 1932.

A maternal grandmother and uncle died with tuberculosis. Her father died five years before from

kidney trouble. One sister aged seven and the mother were alive and well. While the patient was in hospital the mother was examined by the Central Tuberculosis Clinic, with negative results.

The child progressed satisfactorily until the age of 14 months, when she developed what was diagnosed as impetigo of the face. This diagnosis was doubted because of the large irregular papery white scars, on the forehead and over the bridge of the nose, which have persisted. At the age of two years she contracted diphtheria, complicated by paresis of the lower extremities. During the following winter she suffered with numerous painful, irregular ulcers, varying from a pin head to a five cent piece in size, occurring mainly



FIG. 1.

FIG. 2

FIG. 1.—(Case 2). Illustrating the size and extent of the ulceration of the lip.

FIG. 2.—(Case 2). Illustrating two irregular, raw ulcers in the cheek.

TABLE III

Date	White blood cells	No. of polymorphonuclears	Polymorphonuclears per cent	Lymphocytes per cent	Mono-cytes per cent	Red blood cells	Hæmoglobin per cent	Remarks and Treatment
Mar. 20	2,000	200	10	86	4	4,300,000	76	Reticulocytes 1.7 per cent; many cells showing diffuse basophilia.
Mar. 23	2,200	308	14	85	1	3,950,000	65	Reticulocytes 0.8 per cent; serum bilirubin 0.3 mgrm. per 100 c.c. Icterus—index 4.3. 100 c.c. citrated blood were given intravenously.
Mar. 25								Left mastoidectomy, followed by 100 c.c. of citrated blood and 325 c.c. of 10 per cent glucose in saline.
Mar. 27	1,200		15	84	1	3,490,000	66	Reticulocytes 0.1 per cent. 100 c.c. citrated blood with 3 c.c. of liver extract were given intravenously.
Mar. 28								20 c.c. of polyvalent anti-streptococcal serum were given intramuscularly.
Mar. 31	1,050	168	16	60	24	3,320,000	52	Only 1 normoblast seen. Platelets very few. Some poikilocytosis. 80 c.c. of citrated blood were given intravenously.
April 1								100 c.c. of citrated blood were given intravenously.
April 3								200 c.c. of blood were withdrawn. 290 c.c. were given intravenously. Blood culture streptococcus.
April 4	Death							

TABLE IV

Date	White blood cells	No. of polymorphonuclears	Polymorphonuclears per cent	Lymphocytes per cent	Monocytes per cent	Eosinophiles per cent	Red blood cells	Hæmoglobin per cent	Remarks and Treatment
Aug. 5	2,200	44	2	88	5	5	5,160,000	71	
Aug. 8									0.3 grm. neosalvarsan intravenously.
Aug. 11	1,450	50	3½	91	4	1½	4,180,000	70	
Aug. 12	2,250	135	6						
Aug. 13	2,150								5 c.c. aolan intramuscularly.
Aug. 15	2,100	189	9	89	2				Mostly eosinophiles.
Aug. 16									0.3 grm. neosalvarsan intramuscularly.
Aug. 17	4,550	546	12	83	5				7 c.c. aolan intramuscularly.
Aug. 18	3,150	220	7	93			4,210,000	63	
Aug. 21	2,350	235	10	86	4				10 c.c. aolan intramuscularly.
Aug. 22	2,100	315	15	82	3				
Aug. 25	2,700	513	19	78	3				
Aug. 27	2,450	416	17	81	2				
Aug. 29	2,900								
Aug. 31	3,000	390	13	84	3				0.3 c.c. vaccine.
Sept. 3									0.4 c.c. vaccine.
Sept. 5	1,750	70	4	94	2		12,860,000	40	
Sept. 8	1,550								
Sept. 9	2,600	377	14½	71	7½		2,790,000	39	11 per cent stab.; 3 per cent old; 7 per cent basophiles. Poikilocytosis and normoblasts. 0.5 grm. adenine sulphate with 5 c.c. extract in 30 c.c. of water intravenously.
Sept. 10	950	95	10	61½	20½	8			Reticulocytes increasing; 2 megaloblasts seen. 0.5 grm. adenine sulphate in 30 c.c. of water intravenously.
Sept. 11	1,400	210	15	50½	26½	8			Metamyelocytes 11 per cent; stab. forms 4 per cent; sedimentation time 0.5. 0.7 grm. adenine sulphate in 35 c.c. of water intravenously.
Sept. 12	1,500	357	23½	61½	12	3½	2,960,000	40	Red cells look quite normal.
Sept. 13									150 c.c. whole blood transfusion.
Sept. 14	1,850						3,370,000	45	10 c.c. pentnucleotide were given intramuscularly.
Sept. 15	1,050	84	8	68	17	7			3 per cent metamyelocytes, 5 per cent old forms, 10 c.c. each night and morning of pentnucleotide.
Sept. 16	2,000	220	22	70		8	2,310,000	38	12 per cent myelocytes, 6 per cent metamyelocytes, 4 per cent stab. forms. Megaloblasts present. Some poikilocytosis. Platelets in clumps and singly. 20 c.c. each night and morning of pentnucleotide.
Sept. 17	Died.								

on the extremities. The previous fall and winter the ulcers had prevailed with greater frequency and had been more severe and involved more tissue. At one time she was confined to bed for two weeks and unable to walk for six weeks.

The foul ulcer (see Fig. 1) now present over the right third of the lower lip began one month prior to admission. A week before a black slough separated, leaving a raw granulating surface, with a seropurulent discharge. Physical examination showed a thin, pale listless girl, with papery-white scarring over the bridge of the nose and forehead. An incision scar was present in front of each ear. The lower right incisor teeth were loose. The gums were swollen, dirty and bled easily. The right submaxillary gland was swollen and hard, but not painful to pressure. The liver and spleen were just palpable. A small ulcer over the volar aspect of the forearm had been present for three weeks with no sign of healing. Otherwise the physical examination was negative. Her temperature was normal and remained so while in hospital. The white blood count was 5,050, with 16 per cent polymorphonuclears, 66 per cent lymphocytes, 6 per cent monocytes, 4 per cent eosinophiles, and 2 per cent basophiles.

A smear and culture from the lip ulcer showed staphylococci and diplobacilli; a smear from the gums showed Vincent's organisms in large numbers. An intradermal tuberculin test was negative. Blood culture, and blood and spinal fluid Wassermann tests were negative. The mother's Wassermann test was also reported to be negative.

Energetic local antiseptic treatment was applied to the gums and lip ulcer. On February 6, 1932, she was discharged, the lip ulcer practically healed, with the diagnosis of a severe Vincent infection of the mouth. The white blood count on discharge was 6,200, with 34 per cent polymorphonuclears, 44 per cent lymphocytes, 10 per cent eosinophiles, and 12 per cent monocytes.

The child was re-admitted 5½ months later (July 30, 1932) with swelling of the right cheek of nine days' duration. A raised indurated area half way between the angle of the jaw and chin with a central opening was present. There was a similar lesion farther back. The submaxillary, submental, occipital, and axillary glands were all enlarged and hard but not painful to pressure. (See Fig. 2). The liver was just palpable and the spleen extended one fingerbreadth below the costal margin. The blood showed 3,200,000 red cells with 49 per cent hæmoglobin. The white cells numbered 2,800, with 11 per cent polymorphonuclears, 70 per cent lymphocytes, 3 per cent eosinophiles, 2 per cent basophiles, 1 per cent monocytes, and 6 per cent undetermined. Vincent's organisms were recovered from the mouth and *Staph. aureus* was cultured from the ulcer.

A direct transfusion of 260 c.c. of blood raised the red cells to 5,160,000, with 71 per cent hæmoglobin. The white cells were 2,200, with 2 per cent polymorphonuclears, 88 per cent lymphocytes, 5 per cent each of eosinophiles and monocytes. Two 0.3 grm. doses of neosalvarsan were given intravenously one week apart. Her temperature, which had been around 100°, began to rise and swing. The spleen increased in size until it was within an inch of the iliac crest. The lymph nodes were all enlarged. Five, 7 and 10 c.c. of aolan were given on three successive occasions, four days apart. The white blood count remained about 2,200 for a month, and then dropped to 950. The percentage of granular cells remained low. A further transfusion of 150 c.c. was given. The other cheek became involved and a slough appeared about the anus. Multiple punched-out circular ulcers appeared on the arms, face and buttocks. The skin immediately surrounding was black, necrotic and dry. There seemed to be an entire absence of resistance. Her condition became progressively worse. Irritability gave way to drowsiness,

which in turn was succeeded by coma. Pentnucleotide was given intramuscularly the last four days. The child died on September 17th. The details of treatment and condition of the blood can best be followed from Table IV.

*Microscopic examination.*—(Autopsy report by Dr. Bruce Chown).—"Skin: From the edge of the area of necrosis. There are two very striking things. First, throughout the whole tissue, both superficially and in the depths, there is no cellular reaction, either polymorphonuclear or round-celled. Secondly, there are enormous numbers of organisms growing in the tissues as in an ideal culture medium. Both cocci and small bacilli are present. The latter are to be specially noted since only staphylococci grew from the granulating surface and from tissue removed for biopsy.

*Lymph-node:* The typical structure with germinal centres and surrounding follicles has quite disappeared. The blood vessels are dilated prominently and between lie irregular masses of cells among which a moderately large cell with a vesicular nucleus predominates. There are some small lymphocytes, an occasional eosinophile cell, and an infrequent mitotic figure.

*Bone marrow:* All cell types of the bone marrow series are present in reduced numbers, the eosinophile group being particularly prominent. There does not appear to be any overactivity. There is no lymphocytic overgrowth.

*Liver:* In addition to probably unimportant parenchymal changes there are, particularly about the vessels of the portal tract, small collections of cells, nearly all small lymphocytes.

*Kidney:* Again there are unessential parenchymal changes, and interesting interstitial deposits. In one section there are two small wedges reaching from below the capsule for about 1.5 mm. into the cortex. The tubules here have largely disappeared; the glomeruli are in part sclerosed, and in the place of the normal tissue are many small and large round cells. Minute collections of similar cells are scattered through the cortex and, to a less extent, the medulla. The peripelvic tissue contains many lymphocytes.

*Spleen:* The white cell elements have almost disappeared, so that the organ consists of blood and a few lymphocytes.

In the remaining organs there were no lesions pertinent to the discussion.

Pathologically-speaking, then, we have a severe bacterial invasion of the skin and subcutaneous tissue without evidence of local cellular resistance to the invasion; a disappearance of the normal elements of lymph-node and spleen; a bone marrow apparently still turning out some cells of the myeloid series; and lymphocytic deposits in the liver and kidney. The nature of these deposits is open to interpretation. The larger ones in the kidney I feel definitely are inflammatory in origin and represent the remains of an interstitial nephritis or so-called pyelitis. Whether the smaller deposits in the kidney and liver are of similar origin, reactions to a blood-borne infection, or are of the nature of foci of lymphocytic development, that is aberrant growth centres, or again are allied to the deposits seen in lymphatic leukæmia, one can only surmise. I personally prefer to look upon them as feeble responses to infection."

Since the above was forwarded for publication we have seen two additional cases. I am indebted to Dr. J. R. Davidson for permission to present Case 4.

#### CASE 3

Douglas M., aged 9, was admitted to the Winnipeg General Hospital on June 4, 1933, with a history of having been well until 5 weeks previously, when he developed chills and fever. Five days later several red painful circumscribed areas developed on his legs and

arms. One of these was opened and contained blood. Two weeks before admission he had a violent nose bleed which kept up intermittently for two days. He had always had spongy gums but all through his present illness they bled frequently. On admission he was an obviously sick boy, very pale and feverish.

Positive findings on physical examination were (1) ulcerative stomatitis, (2) a few localized pustules on right arm, (3) a few ecchymoses on his legs, (4) smear from gums showed numerous Vincent organisms.

Blood picture was as follows: red blood cells, 1,060,000; white blood cells, 3,300; polymorphonuclears, 8 per cent; lymphocytes, 74 per cent; monocytes, 18 per cent; haemoglobin (Sahli), 28 per cent; colour index, 1.4; halo test, 7.48; platelets, 200,000; bleeding time 9 min.; clotting time, 3 min.; reticulocytes, 0.49 per cent. Differential red cells negative except for slight anisocytosis.

The clinical course was steadily downward.

He received pentnucleotide K96, 20 c.c. intramuscularly daily for 12 doses and a blood transfusion averaging 125 c.c. every other day. He developed an acute mastoiditis which was opened. The leucocyte count continued to drop and was 1,750 on the day preceding death (June 18th). Autopsy findings showed a primary Ghon tubercle in the right lung. There was no apparent evidence of hypoplasia of the bone marrow.

#### CASE 4

Mr. F.D., adult, admitted to service of Dr. J. R. Davidson on June 12, 1933, with complaints of sore throat for two months, chills for five days and boils for five days. Three days before admission right side of throat and neck became very painful and patient felt poorly from then on.

On admission, examination of the throat revealed a small ulcer on the right anterior pillar of the fauces. Numerous pustules and superficial ulcers over front of abdomen. Blood findings were as follows: red blood cells, 3,960,000; white blood cells, 850; haemoglobin (Sahli), 77 per cent; polymorphonuclears, 3 per cent; lymphocytes, 90 per cent; monocytes, 7 per cent; colour index, .96; bleeding and clotting time normal.

He received a transfusion and 10 c.c. of pentnucleotide intravenously followed by 20 c.c. nucleotide intramuscularly daily. He lived for seven days. The leucocyte count rose to 2,900 and then fell steadily.

On the day of death there were 950 leucocytes with no polymorphonuclears to be seen in the differential smear.

Case 3 we regard as an example of sepsis with extreme leucopenia. Case 4 is an example of agranulocytic angina. In neither case was pentnucleotide therapy of even temporary benefit.

#### SUMMARY

Two cases diagnosed as primary recurrent agranulocytosis are reported in female children, aged 5 and 6 years. A combination of treatment was used in both cases, transfusions, foreign protein, arsenic, adenine sulphate, and pentnucleotide K96 with negative results.

Two cases occurred in males, one of them being an adult. Treatment here was equally ineffective.

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## GRANULOMATOUS MYOCARDITIS

BY JAMES MILLER, M.D., F.R.C.P. (EDIN.),

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IN his text-book on Diseases of the Heart (1924)

Henri Vaquez mentions a form of myocarditis which he names "primary subacute." He states that Josseraud and Gallavardin first drew attention to this condition in 1901. It occurs in young subjects with no history of rheumatism, typhoid or other infective disease. The disorder commences abruptly, sometimes with cerebral or pulmonary embolism. There is dilatation of the heart with gallop-rhythm, dyspnoea, cyanosis, enlargement of the liver, generalized dropsy and albuminuria. Death occurs from heart failure. At the autopsy hypertrophy and dilatation of the heart is found with a subacute interstitial myocarditis and no lesion of the coronary vessels. Thrombosis occurs in the heart cavities. The author considers the etiology somewhat mysteri-

ous, but thinks that in some cases it is syphilitic or tuberculous. A good résumé of the literature is to be found in a paper by W. S. Boikan.<sup>1</sup> He names the disease "myocarditis perniciosa" on account of its progressively fatal character. He states that the cause is unknown, but that it appears to be a germ with a selective action upon the heart muscle.

It seems probable that more than one condition is included under these names but there is strong evidence that some cases at any rate have a tuberculous origin. As is well known, the tubercle virus seldom produces recognizable lesions in the heart muscle, but G. Liebermeister<sup>2</sup> describes 7 cases of tuberculosis with more or less marked myocardial lesions. In one of these with advanced bilateral pulmonary tuberculosis, the appearances corresponded fairly well with those in the case described below. Gallavardin

\* Read before the International Association of Medical Museums, Philadelphia, Pa., April 27, 1932.

and Gravier<sup>3</sup> cite two recent cases, one in a man aged 33, with all the characteristic symptoms mentioned by Vaquez, in which old fibrous cicatrices were found at one apex, old pleurisy and a chronic peritonitis. The heart showed an extensive myocarditis, with areas of necrosis and round-cell infiltration but no lesions characteristic of tuberculosis. No tubercle bacilli were found and no animal inoculation was made. The diagnosis of tubercle was based upon the fibrosed apex and the chronic peritonitis. The second case was in a woman aged 37, in whom there was no evidence of tuberculosis and no suggestion of syphilis. The lesions were present in the wall of the left ventricle and appeared to be of a similar nature to those found in the first case.

Cases have also been described by Pancet and Leriche (cited by Boikan) where there were no tubercle lesions in any of the other organs, but inoculation of a guinea pig gave positive results and by Luscher (cited by Boikan) in which there was definite tuberculosis of kidney and glands. The case cited by Boikan himself was that of a young woman with a history of throat trouble. The case rapidly progressed to a fatal issue. A subacute inflammatory lesion was present in the wall of the left ventricle, characterized by mononuclear cell infiltration, fibrinous exudate, and fibrosis.

#### CASE REPORT

The patient, a Chinaman, fifty years of age, was admitted to an institution on May 19, 1931. Physical examination at this time revealed nothing of note. The Wassermann test was negative. The first illness was in June, 1931, when the patient reported to the hospital complaining of his mouth. An ulcer was found in the roof of the mouth, just behind the central incisors, roughly triangular in shape, the base  $1\frac{3}{4}$  inches across. It was covered with black slough. The patient stated that it had been there for five days. A diagnosis of osteomyelitis of the jaw was made and a tooth was extracted, after which healing took place. The patient remained in hospital for eleven days. During the period in hospital there was slight fever but at no time was the temperature higher than  $100^{\circ}$ . An analysis of the urine at the time showed nothing of note.

On August 11th the patient returned showing a painless swelling of the tissues on the posterior aspect of the right arm. The area was oval in shape, hard, and appeared to be in the substance of the triceps muscle. At the same time the right leg from knee to ankle was found to be the seat of oedema not associated with pain. The patient was again admitted to hospital, and at this time showed a temperature which at its highest point reached  $103^{\circ}$ . There was acceleration of the pulse rate in harmony with the fever. There was no indication of heart involvement, and the urine analysis was again negative.

In September of the same year a swelling appeared in the right cheek low down over the mandible. When first seen this was half an inch in diameter, freely movable over the deep structures but adherent to skin.

No ulceration was present. The nodule steadily increased in size until it was  $1\frac{1}{2}$  inches in diameter. Early in January this nodule was removed, examined microscopically, and a diagnosis of a subacute inflammatory lesion given.

On January 12, 1932, the patient complained of pain under the ribs on the left side. There was no pyrexia and the pulse rate was 85. The temperature gradually rose, as did also the pulse. The abdomen became distended but there was no pain or tenderness. Vomiting occurred on January 18th and the patient died the following day. Seen the day before death by a consultant, evidence of myocardial involvement with auricular fibrillation was found, but the heart did not appear to be dilated.

*Autopsy.*—The salient facts revealed by autopsy were these. The pericardial sac was distended with a large quantity of turbid fluid. The surface of the heart was covered with recent fibrinous exudate. The valves of the heart were normal. The wall of the left ventricle showed extensive areas of necrosis and hæmorrhage (Fig. 1). No lesions were found in the muscle of other

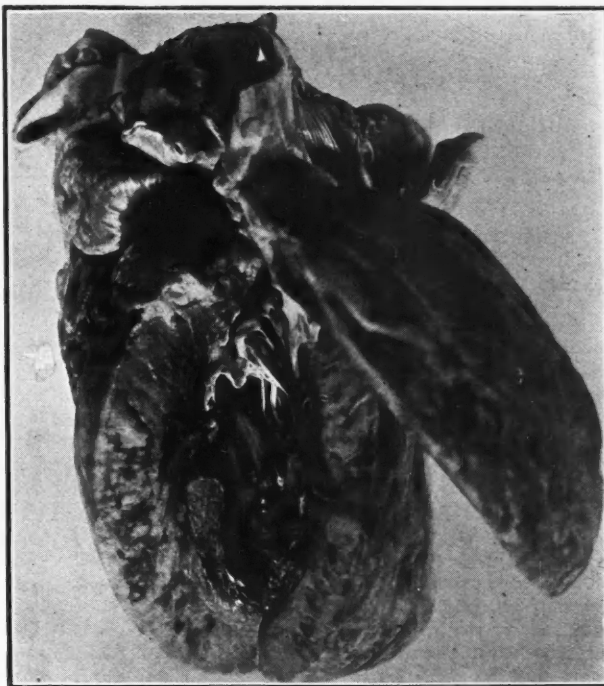


FIG. 1.—Wall of left ventricle in section showing areas of hæmorrhage and necrosis.

parts of the heart, and there was no thrombosis in the cavities. The coronary arteries were not diseased. There was scarring at the apex of the left lung and congestion and oedema of both bases. There was a large quantity of purulent fluid in the abdomen. Films from pericardial and abdominal fluid were negative as regards organisms. One ulcer, transverse in direction, was present about the mid portion of the small intestine. The glands of the abdomen were slightly enlarged. The spleen was greatly enlarged, soft and pale.

Cultures were made from the spleen in Muller's enrichment broth and in brilliant green peptone water. Films were made and the broth cultures were plated out on several days following, but the results were entirely negative.

*Microscopic examination of the heart muscle.*—Unusual as were the appearances in the gross those under the microscope were unique. Immense areas of the heart muscle were infiltrated with a rather large type of mononuclear cell (Figs. 2, 3 and 4). These cells varied somewhat in size and shape, but the predominant type was elongated rather than polygonal, with a large oval

nucleus with open chromatin network. Mitotic figures were fairly numerous and multinucleated cells occurred. Cell-inclusions were frequent within the protoplasm and suggested phagocytosed red blood corpuscles. There was little difficulty in concluding that a majority of these cells had their origin in the endothelium of blood vessels, as evidence of active proliferation in the intima of capillaries could be made out. Rounded lymphocyte-like cells were present in small numbers and plasma cells were fairly numerous. Polymorphonuclears on the other hand were infrequent. Phagocytosis of muscle cells by the mononuclears could be observed (Fig. 4). Increase of lipoid pigment, pronounced fatty degeneration and necrosis of muscle fibres was seen, and yet the striation of the fibres was often preserved (Fig. 3). The

It was most unfortunate that no animal inoculations were made from the heart lesion.

Was the condition tuberculous? There was scarring at the apex of the left lung, and there was a suggestive ulcer, transverse in direction, in the small intestine. On the other hand none of the lesions were histologically suggestive of tubercle. There were no tubercle follicles and the giant cells were not of such a type as to suggest tubercle. Moreover (not a very strong

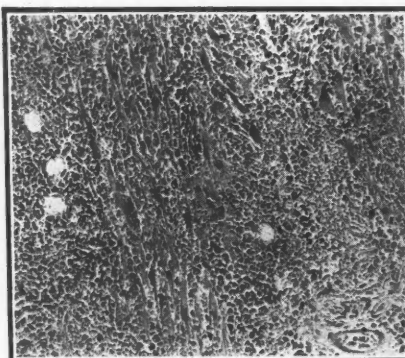


FIG. 2.—Low-power view of heart muscle showing diffuse infiltration with mononuclear cells, also foci of necrosis.

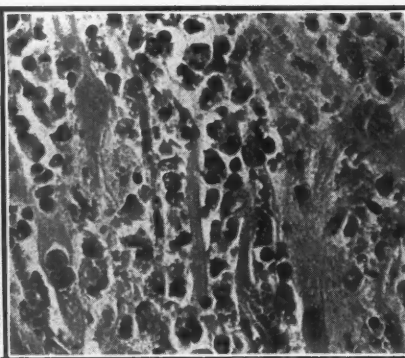


FIG. 3.—High-power view of heart muscle showing type of mononuclear cell infiltrating fibres; an occasional polymorphonuclear cell is seen.

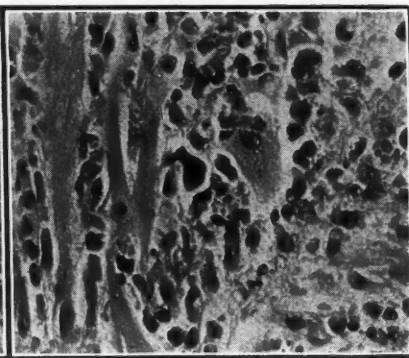


FIG. 4.—High-power view of heart muscle showing cell infiltration with giant cell in centre and to one side a muscle fibre in process of destruction by phagocytes.

necrosis of small and large areas of the heart muscle was one of the outstanding features of the condition. In the necrotic areas red blood cells were prominent as was obvious by the naked eye examination. Fibrinous exudate could be seen in the necrotic areas but there was little visible on the pericardium. There was little evidence of organization of the pericardial exudate. The pericardium itself and the underlying fat were extensively infiltrated with the same mononuclear type of cell. Numerous sections stained with Gram's method, eosin methylene blue, Ziehl-Neelsen, and Levaditi showed no trace of any microorganism. The changes in the nodule removed from the jaw and those in the ulcer of the intestine were precisely similar to those met with in the heart muscle. The appearances in the liver, kidney and lung merited no special attention; they were those of toxic change and congestion. In the spleen which grossly was strikingly enlarged there was congestion, hæmorrhage, and hyaline swelling of the walls of the arterioles.

#### DISCUSSION

It is obvious from a review of the clinical history of this case that the man had been suffering from some sort of prolonged infection with metastatic foci appearing at different times in the palate, right arm and jaw, and with a phlebitis of the right leg. The post-mortem revealed in addition lesions of the myocardium and small intestine. The pericarditis was certainly secondary to the myocarditis, and the peritonitis was probably due to extension through the base of the intestinal ulcer. Attempts to track down the organism by cultures from the spleen proved abortive.

point, however) no tubercle bacilli were found in the lesions, although careful search was made. Syphilis suggests itself as a possibility. Against it is the negative Wassermann test and the absence of spirochætes, although the search for these latter was commenced with high hopes of success. Was the condition perhaps some obscure eastern complaint unfamiliar to the western pathologist? Against this is the fact that the disease was most probably acquired in Canada. There remains the rather vague disease variously described as "subacute myocarditis" and "myocarditis perniciosa." It must be acknowledged that the clinical history does not correspond to that of most of the cases in literature. The symptoms in this case were not those of progressive cardiac weakness and dilatation. At the same time the histological picture corresponds fairly closely to that described by several of the authorities mentioned. The changes in this instance appear, however, to have been more acute than in any previous case of the disease. Fibrous tissue formation was conspicuous by its absence and necrosis was a prominent feature. On the whole I am inclined to conclude with Boikan that there is a disease entity due to an as yet undiscovered microorganism which shows a special affinity

for the heart muscle, producing there lesions of a subacute inflammatory type. Whether this disease is rightly named subacute myocarditis or myocarditis perniciosa I am doubtful. On the whole I am inclined to favour the use of the term granulomatous myocarditis. It is at least applicable to the case under consideration, and

seems to fit some of the other cases described in literature.

I am indebted to Prof. John Wyllie for the cultural investigations in this case.

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## PRIMARY SARCOMA OF THE INTESTINE\*

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OF the primary malignant tumours occurring in the intestine, sarcoma is among the least common. In fact, so uncommon is it that it has been referred to by some writers as a pathological curiosity. When contrasted with the incidence of primary carcinoma of the intestine, one is especially impressed by its infrequency. In the twenty-five years between 1905 and 1930, 157,488 patients were admitted to the Montreal General Hospital. Only 8 of these were proved to have primary sarcoma of the intestine. During the same period there were 579 cases of primary intestinal carcinoma in the hospital. Statistics from other large hospitals show about the same relative occurrence of this type of tumour. Its comparative rarity is one of the reasons why primary intestinal sarcoma has been seldom diagnosed clinically.

There have been over 200 cases of primary sarcoma of the intestine reported in the literature. The majority of these appear as individual case records. The first comprehensive review of the subject was made by Baltzer<sup>1</sup> in 1892, although earlier writers, including Virchow, Rokitansky and others recognized and described these tumours. Baltzer published reports of 14 cases collected from widely distributed sources. His monograph is referred to extensively by subsequent writers among whom are Lehman, Lecine,<sup>8</sup> Treves, Moynihan, Nothnagel, Speese,<sup>12</sup> Smoler, Douglas,<sup>5</sup> Ewing and more recently, Fisher,<sup>6</sup> Moir and Walker,<sup>9</sup> and Murray.

In 1904 Lecine collected 89 cases and reported them. Nothnagel found only 3 cases in 21,000 autopsies in Vienna between 1882 and 1893, though Smoler reported 13 in 13,000 post-mortems in Prague. Osler states that from 1882 to 1893 only 12 cases were recorded at the General Hospital in Vienna. Fisher, who examined the records of the Royal Prince Alfred Hospital, Sydney, Australia, found that, exclusive of rectal tumours, there were in 15 years only 5 cases of primary sarcoma of the intestine, as against 260 cases of other kinds of primary malignant tumour.

The cause of primary sarcoma of the intestine is not known. Nevertheless, a few points merit consideration. Whatever the interpretation, the association of a history of trauma with the occurrence of sarcoma in general is a matter of common knowledge. In sarcoma of the intestine, the influence of trauma as a causative factor is less clear than in some other locations. This has been referred to by Mumey.<sup>10</sup> It is, in part, due to the protection afforded by the abdominal wall, and, in part, to our inability to conceive of injury to the intestines. However, there is a history of preceding trauma in some of the reported cases. This has usually been in the form of a blow on the abdomen. In our series, only one case (No. 1) gave a history of symptoms dating definitely from a trauma. Two of our series (Nos. 7 and 8) had had typhoid fever, one 16 and the other 29 years before sarcoma was recognized. This association in our cases may have been irrelevant, especially in view of the intervals between the typhoid fever and the

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appearance of the sarcomata. Besides, typhoid fever has been, and in some places still is, a very common disease, yet no proved relation has been established between the two diseases. Primary intestinal sarcoma following typhoid fever has been previously referred to. Moir and Walker reported a case in which a sarcoma of the intestine occurred immediately following typhoid fever. It may be noted also that the great majority of cases of intestinal sarcoma are of the lymphocytic cell type, and it is the lymphoid tissue of the intestines that is especially involved in typhoid fever.

Baltzer stated that over 50 per cent of the cases of primary sarcoma of the intestine occurred in the fifth decade. More recently, Speese has found that these tumours occurred in order of frequency in the 3rd, 4th, 5th and 2nd decades. Cases have been reported in all decades up to the 8th. The youngest case reported was in a child of three years. In our series the ages were 32, 38, 43, 48, 50, 55 and 74 years. Dr. H. B. Cushing, Pædiatrician-in-Chief to the Children's Memorial Hospital, Montreal, had on his service last year a boy 13 years old who had intestinal obstruction due to a primary lymphosarcoma of the small intestine.

Most authors give the proportion between males and females as more than two to one. In our series of 8 cases, there was only 1 female. The age and sex incidence of malignant tumours of the intestine other than sarcomata is given for purposes of comparison. Kaufmann states that the average age of occurrence of carcinoma of the intestine is 55 years, and that males predominate in the proportion of two to one. It will be seen that these figures show a close correspondence with those for sarcoma.

Several writers have claimed that there is sufficient similarity in the histories of cases of primary sarcomata of the intestine to warrant a special symptom-complex for this disease. In a recent article Mumey went so far as to give a typical clinical picture as follows: abdominal pains of indefinite character; irregular stools with alternating constipation and diarrhœa; loss of weight; anæmia and cachexia; palpable abdominal tumour (moveable or fixed); marked constitutional effects with hidden local signs. It is the consensus of opinion, however, that these tumours lead to no charac-

teristic clinical picture and our series bears this out. Most writers have stressed the insidiousness of the onset, but this is all too true of other tumours of the intestine. While there does not seem to be a typical clinical picture connected with these tumours there are several outstanding symptoms associated with them. The following, in order of their prominence, may be mentioned:—

- (1) Persistent indefinite abdominal pain. This occurred in cases Nos. 1, 2, 4 and 5 of our series, *i.e.*, 50 per cent.
- (2) Irregular bowel action, frequently amounting to alternating constipation and diarrhœa. In our series cases Nos. 5 and 6 had diarrhœa with blood and mucus occasionally, while case No. 8, who had a rectal tumour, also suffered from urgency of bowel action.
- (3) Rapid loss of weight. This occurred in Nos. 5 and 6 of our series.
- (4) Cachexia and anæmia. This occurred in all but Nos. 2 and 7 of our cases. It was particularly marked in Nos. 5 and 6.
- (5) Melæna. In our series this was noted in cases Nos. 2, 5, 6 and 8.

All the above symptoms, when taken in conjunction with a palpable abdominal tumour, moveable or fixed, should lead one to consider the possibility of sarcoma, especially when they occur in younger persons. Yet, they by no means rule out carcinoma and, to a lesser extent, other lesions such as tuberculosis. Perforation of the bowel is an uncommon complication of sarcomata, but does occur, as is illustrated in one of our series (case No. 4). Obstruction is also said to be rare, yet in our series it was the principal feature of the clinical picture in 5 of the 8 cases. This may, in part, be due to the fact that as a rule only acute conditions are admitted into the surgical wards of the Montreal General Hospital.

The points which help to distinguish sarcoma of the intestine from carcinoma of the intestine are as follows:—

- (1) The clinical course of a sarcoma is, in general, more rapid, and is characterized by an earlier and greater cachexia and by loss of weight.
- (2) Localizing signs and symptoms are more apt to be present with carcinoma, because it shows a greater tendency to lead to stenosis of the bowel.
- (3) Sarcomata have a tendency to become immobile early and to assume larger proportions.
- (4) Hæmorrhage with melæna is less common and occurs later

in sarcomata. (5) Sarcomata are more likely to occur at an earlier age, though this is not always the case. (6) Obstructive symptoms are less likely to occur early with sarcomata because they have not the same tendency to circumferential growth as carcinomata. When obstruction does occur, it is more likely to be due to kinking from adhesions or mesenteric extension of the tumour than to blocking of the lumen of the bowel as in carcinoma. It follows that intestinal obstruction in sarcoma is more apt to be acute and the clinical picture a severe one. This occurred in 5 of our 8 cases as follows. In case No. 1 extension of the growth into the mesentery and adhesions had caused matting of the bowel with kinking. Case No. 2 showed a volvulus caused by adhesions between the ileum and the transverse colon. In case No. 3 there was a double kink, also caused by adhesions. In cases Nos. 4 and 5 adhesions again played the major rôle in the acute obstruction which had occurred.

Tuberculosis may be ruled out clinically with a good deal of certainty, as in most cases the mass is less prominent and the clinical course suggestive of a tuberculous lesion. It was not considered in any of our cases. With our present methods of diagnosis, we must in no small measure depend upon x-ray findings if we are to diagnose these tumours earlier and give them the advantage of operation while the tumour is still localized.

Early and radical surgical interference is indicated. As wide an excision of the tumour as possible should be carried out, together with its regional mesentery and lymph nodes. Individual cases will, however, present special problems and complications requiring various methods of procedure. To enlarge on this would be superfluous. The operative mortality is stated by Thompson to be approximately 25 per cent.

Radium has been employed in the treatment of these tumours both as a palliative and in conjunction with radical operation. Des Noyells,<sup>4</sup> Kahn and others state that in both instances prolongation of life and greater comfort can be assured the patient. It does not appear to have been used as a pre-operative measure. X-ray therapy has given similar beneficial results. In none of our cases was either radium or roentgenotherapy used. In a recent article published in Nelson's Encyclopedia, Lacassagne

sums up by stating that though both x-rays and radium therapy are beneficial, one should remember that roentgen therapy is more easily employed, and also that when radium is used external application in very large quantities is necessary for results and this is not always available. This is followed by an extremely long period of healing, sometimes lasting for years, and at times is interrupted by the recurrence of metastases. He further adds, however, that external radium therapy is more valuable than x-rays where recurrent nodules have occurred in scar tissue. Both radiotherapy and x-ray therapy are preferable to such procedures as amputation of a limb, and should therefore be given precedence. Finally, he states that, generally speaking, roentgen therapy is to be preferred to radium therapy for the following reasons: (1) it is more easily employed; (2) in the case of radium therapy that disappearance of the lesion takes place only when very large quantities of radium are used and such are not always available.

As in other kinds of primary malignant tumours of the intestine the prognosis in primary sarcoma bears a definite relation to the kind of sarcoma, its size, its duration, relations, and to the degree of its differentiation. Only those more mature types of sarcomata, such as the fibrosarcomata, can be said to have a favourable prognosis, even under the earliest and best of surgical treatment. This is well illustrated in case No. 2 of our series which was our only fibrosarcoma, and the only one of our patients known to have survived any number of years after operation. She is alive and well twenty years after operation. Similar fibrosarcomas have been reported as alive and well from 7 to 18 years post-operatively. Ours is the longest on record. In the other less mature types of sarcoma, the prognosis, even after early and adequate operative procedure, is poor. Our present hope for improvement in prognosis lies in earlier diagnosis and early and proper operative interference.

In our series of 8 cases, 6 were lymphosarcomata, a type in which the prognosis is always poor, no matter where the growth occurs. One was a large round-celled sarcoma and more mature than the lymphosarcoma, but complicated by acute obstruction, while in the remaining case, a fairly mature fibrosarcoma was found. The gratifying results following

operation on the last named case have been characteristic of this type of tumour. Of our 6 lymphosarcomas, 5 are known to have died. Of these five, three died within a few days of the operation, from complications, and one lived for six months and died of pneumonia, while another died of recurrence eighteen months after operation. The fate of one case of lymphosarcoma is not known. The patient with large round-celled sarcoma, which was complicated by acute intestinal obstruction, died within twenty-four hours of his operation. It is hardly necessary to add that such complications as obstruction greatly increase the seriousness of the immediate outlook, and our experience has been particularly unfortunate in this connection.

The following are the reports\* of our 8 cases of primary sarcoma of the intestines. Each case is given in detail, in order that its clinical and pathological aspects may be made clear.

#### CASE 1

(M.G.H., No. S-08-1256). Service of Dr. Geo. E. Armstrong. S.D., occupation unknown, a male, aged 48 years, had a history of annoying dull pain in the umbilical region for six months. He stated that it began shortly after he had been struck on the abdomen by an iron bar. The pain was more or less constant, gnawing in character, and bore no relation to meals. Concurrently, he became gradually more and more constipated, and more recently had noticed increasing abdominal distension. Following this, he began to lose weight, strength and appetite. For two days before his admission to hospital, his bowels had failed to move. On the day of admission he suddenly developed severe generalized abdominal colic, followed by nausea and vomiting. Personal and family history irrelevant.

*Examination.*—Temperature 99.3°; pulse 104. The patient was in acute distress and there was a moderate degree of emaciation and pallor. His abdomen was moderately distended, its respiratory movement greatly limited, and on percussion was resonant throughout. A rounded, smooth, and slightly tender mass, "about the size of an orange," was felt in the right lower quadrant. A diagnosis of acute intestinal obstruction was made.

*Operation.*—Right rectus incision. The abdominal wall in the right lower quadrant was infiltrated with new growth which arose from a mass in the lower ileum. This mass, which included several inches of bowel matted together, was adherent to the bladder. The regional mesenteric lymph nodes were enlarged and firm from tumour. The Peyer's patches in the matted bowel were particularly involved by the tumour. Resection and lateral anastomosis was done. The patient made an uneventful recovery from operation and left the hospital three weeks later. This patient's subsequent history is not known.

*Pathological diagnosis.*—lymphosarcoma. The details of the microscopic examination are missing.

\* Three of these cases have already been reported; No. 2 by Dr. W. L. Barlow,<sup>2</sup> No. 6 by Dr. P. G. Silver<sup>11</sup> and No. 8 by Dr. Carl Sutton.<sup>13</sup>

#### CASE 2

(M.G.H., No. S-12-1). Service of Dr. W. L. Barlow. A female, aged 43 years, was suddenly seized with generalized colicky abdominal pain, followed by nausea, vomiting and prostration. Enemata were almost ineffectual, but the discharge contained a great deal of freshly clotted blood. When the patient was 34 years old she had been under medical treatment for "hæmorrhage from the bowels" and anæmia. For several years previous to her admission she had suffered at intervals from recurrent attacks of pain, 1½ to 2 hours after meals, with occasional vomiting and a mild degree of constipation. In spite of a negative barium series she was suspected by her doctor to have a duodenal ulcer and was treated for such. Two years prior to her admission she had been thoroughly investigated in a Montreal hospital, but nothing was found to account for her symptoms, and a diagnosis of gastric neurosis had been made. There was no loss of weight or strength, nor was there any history of trauma. Personal and family history negative.

*Examination.*—Temperature 99.4°; pulse 120; respirations 20. The patient showed marked pallor and was poorly nourished. The abdomen was symmetrical and moved freely with respiration. Slight tenderness was present in the epigastrium. There was no evidence of free fluid, nor were any masses felt.

*Laboratory findings.*—Urine, negative. The stools contained gross fresh blood in clots. Blood count: red blood cells 4,000,000; white blood cells 9,000; hæmoglobin 35 per cent.

There was improvement in the patient for the first three days in the hospital and the blood clots disappeared from the stools. On the morning of the fourth day she had a sudden pain in the abdomen with nausea, marked rigidity and tenderness of the abdomen, pallor and collapse. Her pulse rate was 132.

Immediate operation was carried out through the right rectus incision. A tumour, the size of a hickory nut, was found in the central portion of the ileum. Adhesions to the transverse colon had brought about a volvulus of the involved portion of the ileum. The small bowel distal to this and the colon contained fresh blood. The regional mesenteric lymph nodes were enlarged and fairly firm. Resection and end-to-end anastomosis was done. Post-operative recovery was uneventful. The patient left the hospital on the 21st day after the operation. Eight years after her operation (1920) she was seen by Dr. W. L. Barlow and was found to be in good health, with no evidence of recurrence. She has again been examined this year (1932) twenty years after her operation and no evidence of recurrence found. This appears to be the longest post-operative follow-up that has been reported.

*Pathological report.*—(M.G.H., /S-12-4). The resected portion of the ileum was very congested. Situated in its wall between the mucosa and serosa, and replacing the intervening tissues, was an oval tumour, measuring 4 by 5 cm. in diameter. This projected into the lumen of the bowel for a distance of 1.6 cm., was moderately firm, and the overlying blood vessels were prominent. On section the tumour was firm and fairly homogeneous, and, grossly, there was no evidence of actual infiltration of the surrounding tissues.

*Histological structure.*—A section through the intestinal wall, including a portion of the tumour, showed the mucous membrane to be intact. The blood vessels of the mucosa were dilated and those of the submucosa even more so. The muscularis was almost completely destroyed, though in places fragments were visible. The greater part of the section was composed of tumour tissue which showed the following characteristics. (1) Infiltration of the surrounding tissues was present but was not a very marked feature. (2) The blood vessels of the tumour were quite large, well differentiated, and dilated. (3) The tumour itself consisted of tissue which varied a great deal in charac-

ter. The type cell was spindle-shaped and conformed to that of the connective-tissue series. There was not much interstitial tissue. Where individual cells were seen lying flat they showed considerable cytoplasm. The cells were quite well differentiated and did not show the characteristics of very rapid growth. Diagnosis—fibrosarcoma.

## CASE 3

(M.G.H., No. S-20-2226). Service of Dr. A. T. Bazin. J.D., a male, aged 74 years, had had gradually increasing constipation for two months. As he had previously been mildly constipated, he gave little heed to this, especially as there were no other symptoms. Five days before admission he began to have colicky abdominal pain which rapidly increased in severity. His bowels moved daily until three days before admission, but not thereafter. A physician was called and enemata were administered, which were all ineffectual. On the day before admission vomiting developed, which became fecal almost at once. No history of trauma could be elicited. Personal and family history were negative.

*Examination.*—Temperature 101.2°; pulse 120; respirations 22. The lips were dry and cracked and the patient was very ill and in acute distress. The abdomen was greatly distended, tympanitic, and rigid throughout with generalized tenderness and absence of respiratory movement. There were no palpable masses. Rectal examination was negative. A gastric lavage obtained material with a fecal odour and a brownish colour. Enemata were ineffectual. The heart was considerably enlarged to the left, and both systolic and diastolic murmurs could be heard over the precordium.

Operation was undertaken as a life-saving measure. In view of the grave condition of the patient it was commenced under a local anæsthetic. A left trans-

rectus incision was made. On opening the peritoneal cavity considerable blood-stained fluid escaped. Dark reddish coils of small intestine, united by old fibrous adhesions, were present in the right lower quadrant. The mesentery of this part of the bowel was shortened and thickened in such a way as to produce a double kink in the loop of the bowel, about 5 inches in length. Ether anæsthesia became necessary. The mass was delivered and a lateral anastomosis was done between the ileum and the transverse colon. It was found impossible to do a resection on account of the patient's condition. Following the operation the patient failed to improve and died within 24 hours.

*Pathological examination* (S-20-324).—The resected specimen of ileum showed extensive replacement of the wall by masses of tumour growth. This had extended in places beyond the peritoneal covering of the bowel, and there were numerous masses of firm, enlarged regional lymph nodes. These were adherent in places to the bowel by adhesions which apparently caused the acute obstruction. The bowel showed marked injection of its blood vessels. On gross section the tumour tissue in the bowel wall and in the glands was homogeneous in appearance and showed infiltration of the surrounding tissue.

At autopsy (A-20-147) extensive metastases were found in the gastro-hepatic lymph nodes and in the liver. These metastases had the same gross characteristics as the tumour in the resected specimen.

*Histological structure.*—The tumour was very definitely alveolar in its arrangement. The alveoli varied a great deal in size, and were composed of closely packed tumour cells with very little intercellular tissue. The connective tissue between alveoli was, as a rule, rather scanty. The individual tumour cells were a good deal larger than the small lymphocyte and their nuclei did not stain as deeply. The cytoplasm was quite scanty. The general type of cell corresponded to that

TABLE

Case No.	Hospital No.	Sex	Age	Symptoms	Examination	Operation	Location	Result	Path.
1	S-08-1256	M	48	Struck in abd. by iron bar. Six months dull pain at umb. Ac. obst. symptoms.	Ac. abd. with distention. General tenderness.	Resection and lateral anastomosis.	Lower third ileum.	?	Lympho-sarcoma.
2	S-12-1	F	43	Several yrs. indef. gastro-int. sympt. with occas. melena. Ac. obst. symptoms.	Ac. abd. tender indef. mass to left of umb. Slight cachexia.	Resection and end-to-end anastomosis.	Central third ileum.	Well 20 yrs. after operation.	Fibro-sarcoma.
3	S-20-2226	M	74	Gradual incrs. constipation. Two months 5 days colicky abd. pains. Fecal vomiting, ac. obst. sympt.	Ac. abd. great distention. General tenderness. No masses. Moderate cachexia.	Delivery into wound. Lateral anastomosis. No resection.	Lower third ileum.	Death in 24 hrs. after operation.	Round large cell sarcoma.
4	M-23-2141	M	32	Occ. hæmatemesis with epigastric pain 5 years. One year steady pain with indigestion.	Moderate general resistance. Tenderness epigastrium and orange size mass. Moderate cachexia.	Expl. lap. stopped by patient's condition.	10 cms. from duodenal-jejunal junct.	Died within 48 hours P.O.	Lympho-sarcoma.
5	S-27-545	M	38	Indef. gnawing abd. pain 1 year 3 months diarrhoea, loss weight and appetite. Occ. melena. Ac. obst. symptoms.	Distention and general tenderness more in R.L.Q. No masses. Marked cachexia.	Expl. drainage of abscess. Ileo-cæcal fistula.	Ileo-cæcal junct. metastases. Ext.	Died with septicæmia 6 weeks.	Lympho-sarcoma.
6	M-27-1874	M	50	Diarrhoea with melena and mucus 1 week. Nausea and vomiting, loss of 50 lbs. 4 months 2 weeks colicky pain.	Scaphoid abd. Epigastric tenderness and rigidity. Marked cachexia.	Resection and end-to-end anastomosis.	15 cms. from ileo-cæcal valve.	Lived 18 months.	Lympho-sarcoma.
7	S-29-1644	M	48	Painful swelling, calf right leg. Ten days. No G. I. symptoms.	Egg sized mass. Tenderness in R.L.Q. No cachexia.	Resection lateral anastomosis.	Ileo-cæcal junct.	Died 10 dys. Sec. hæmorr.	Lympho-sarcoma.
8	S-31-249	M	55	Chr. constipation dull pain lower sacral region. Urgency and frequency of defecation. Melena, loss of weight and strength.	Slight fullness abd. No tenderness or rigidity, no masses in abd. Mass in rectum. Marked cachexia.	Lockhart Mummery resection.	Rectum.	Recovered. Died 6 mos. in inter-current pneumonia.	Lympho-sarcoma.

usually described as large round celled sarcoma. Section from the metastatic areas showed identical characteristics. Diagnosis—large round-celled sarcoma.

#### CASE 4

(M.G.H., No. M-23-2141). Service of Dr. W. L. Barlow. D.S., a male bookkeeper, aged 32, stated that one month after being gassed in France, in 1917, he had suffered a severe attack of hæmatemesis, and that this had recurred with varying severity two or three times every year subsequently. He would vomit blood two or three times daily for from three to five days. During the year previous to admission he had more or less persistent epigastric discomfort, with occasional attacks of vomiting which gave relief. He had marked post-prandial gas-eructations and had suffered gradual loss of appetite, strength and weight, which fell from 165 to 113 lbs. His bowels were regular. Personal and family history negative.

*Physical examination.*—The patient was emaciated and anæmic. The abdomen was moderately resistant from the umbilicus to the ensiform cartilage, with tenderness at a point midway between these points. In this region a mass was felt, 8 cm. in diameter, whose outlines were not definite. The inguinal, submaxillary and epitrochlear glands were shotty.

A barium series showed individualization of the upper coils of the small intestine, but no definite obstruction. Gastric analysis was negative. Urinalysis negative. Blood count: red blood cells, 5,300,000; white blood cells, 7,000; hæmoglobin, 60 per cent.

Exploratory laparotomy was performed under ether anæsthesia. The abdomen was opened through a right rectus incision. A mass was felt in a loop of jejunum, which, on being brought out, had the appearance of a malignant growth. This began 25 cm. from the duodeno-jejunal flexure, and extended, though not continuously, throughout 40 cm. of the bowel. The adjoining mesentery contained numerous enlarged lymph nodes. The liver was not enlarged or nodular. It was proposed to do a lateral anastomosis to relieve the patient's pain, but his condition would not warrant this procedure, so only a gland was removed for biopsy, and the wound closed. The patient's condition became rapidly worse and he died within two days.

*Pathological examination.*—(A-23-104). On opening the peritoneal cavity a sero-purulent exudate was found, matting the coils of intestine together. At a point 7 cm. below the duodeno-jejunal flexure there was a small perforation in the bowel. The perforations had soft friable edges. This was seen to be in the centre of the soft gelatinous creamy white growth in the bowel wall which was mainly on the mucosal surface, yet it extended through the other coats for varying distances. The growth surrounded the lumen of the bowel, was irregular in outline, and fairly soft. For 5 cm. distally from this area the bowel was free from the tumour. Then one encountered a second area of bowel, 20 cm. in length, which showed the same kind of involvement with new growth as the first mentioned, but was not perforated. The regional mesenteric glands were enlarged, firm and elastic; some were 3 to 4 cm. in diameter. Section of these showed, grossly, a creamy white soft growth replacing the normal tissue. Several glands in the gastro-hepatic omentum also had the same gross characteristics.

Microscopical sections taken through the intestine at the site of the tumour, showed the wall to be greatly thickened. The mucosa was intact, though thinned. Beneath the mucosa all the coats of the bowel were densely infiltrated, and in places largely replaced by widespread tumour growth. Here and there remnants of the coats remained, but destruction was extensive and the normal structure lost. Infiltration with the new growth extended through the walls and into the adjacent mesentery in numerous areas. The mucosa presented a roughened irregular appearance, owing to

the projections of the underlying tumour cell aggregations. There was no attempt at alveolar arrangement of the tumour cells and only an abortive attempt at stroma formation. The involved lymph glands showed complete replacement with densely packed tumour cells. The individual tumour cells were almost universally small and round, with large centrally placed pale staining nuclei, and only a small amount of cytoplasm. A few had darker staining nuclei and there were fairly numerous mitotic figures. Diagnosis—lymphosarcoma.

#### CASE 5

(M.G.H., No. S-27-545). Service of Dr. C. K. P. Henry. A.D., a male, aged 38, whose occupation was not recorded, had suffered a persistent gnawing pain in the abdomen for about a year. He found that his abdomen was tender when lifting or carrying things against it, and for this reason was finally forced to give up his work. For about three months he had suffered a persistent diarrhœa, and concurrently began to lose weight rapidly, though his appetite remained fairly good. The pain became more severe and at times he vomited, obtaining some relief. He had no pain on defæcation. His stools occasionally contained fresh blood. Two days before admission he had a sudden attack of severe colicky pain in the right lower quadrant, became distended, and began to vomit persistently. Personal and family history negative.

*Examination.*—Temperature 97°; pulse 100; respirations 20. There were very evident anæmia and emaciation. The abdomen was moderately distended, especially in the lower half. It was tender throughout but tympanitic. In the right lower quadrant there was some increased resistance, and tenderness was more evident. On the posterior surface of the rectum, opposite the prostate, was a hard, fungating, firmly fixed mass, 5 to 6 cm. in diameter. The examining finger could just get above this.

A barium enema gave the suggestion of a new growth in the terminal ileum. The colon and the rectum were negative. Urinalysis negative.

Operation was carried out under ether through a left rectus incision. Nodular masses extending along the lymphatics were felt. In the retroperitoneal tissues, at the level of the umbilicus, was an oval mass, 6 to 7 cm. in diameter. Many small nodules were found in the mesentery of the small intestine, and larger ones in the gastro-hepatic omentum. The liver was smooth and there were no nodules in it. Lateral to the cæcum was an abscess filled with *B. coli* pus. Numerous adhesions were found between the coils of the small bowel, which were distended. These were separated and the abscess drained through an incision in the right lower quadrant. Following operation the patient showed only slight and temporary improvement. Within three weeks his right cervical glands became enlarged. One of these was removed for biopsy and showed lymphosarcoma. He then developed an abscess in the neck wound which had to be drained. At the same time the right tonsil was found to be enlarged and this was suspected also to be lymphosarcomatous. He subsequently died of streptococcal septicæmia, five weeks after the operation.

*Pathological examination.*—(A-27-161). The peritoneal cavity did not contain an excessive amount of free fluid. The appendix had sloughed from the cæcum and was lying free in an abscess cavity. The proximal end of the appendix was much thickened, hard and indurated. It appeared to be the seat of a new growth. In the mesentery of the small intestine was an aggregation of lymph nodes, matted together and forming a mass, 10 to 12 cm. in diameter. Other mesenteric lymph nodes were much enlarged, firm and nodular. Studded over the serosa of the cæcum and ileum were numerous small white nodules. In the rectum just proximal to the anal canal was an ulcer, 3 cm. in diameter, with a shaggy necrotic base. Here the surrounding tissues were indurated and the regional lymph nodes enlarged and firm. The head of the

pancreas was imbedded in the mass of tumour involving the adjacent mesenteric lymph glands. The gastro-hepatic glands were also involved. There was a large indurated swelling in the right side of the neck, extending from below the mandible distally almost to the clavicle. In this there was an incised wound discharging pus at the upper pole. The whole mass was firmly fixed in the neck. The right tonsil was enlarged and appeared adherent to the aforementioned mass. The oesophageal and mediastinal lymph glands also showed involvement.

Microscopical sections from the tumour growth in various parts of the body all showed the same general characteristics. The general type of tumour cell was a fairly large undifferentiated lymphocyte. The nuclei were mainly large pale staining with pyknotic nucleoli. Less commonly they were smaller, more homogeneous and darker. Mitotic figures were scarce. Interstitial stroma was fairly abundant and in places assumed dense and wide proportions. Blood vessels were fairly numerous and well developed. Sections from the lymph glands and right tonsil showed, in addition to the above structure, fairly numerous large multinuclear cells. Eosinophiles, however, were very rare in these sections. Sections from the cæcum did not show either of these two last named types of cells. Diagnosis—lymphosarcoma.

#### CASE 6

(M.G.H., No. M-27-1874). Service of Dr. A. H. Gordon. H.G., a fireman, aged 50, was admitted with the story that four months' previously he had for a week suffered from an attack of diarrhoea which became so severe that he passed twenty fluid stools daily. He had never noticed any blood, but on one occasion he passed what appeared to be a piece of tissue with "veins" on its surface. In addition he had had daily attacks of nausea and vomiting, usually an hour and a half after his mid-day meal. Under medical treatment the attacks finally subsided. Following this he remained fairly well and had a good appetite, but began to lose weight rapidly, subsequently losing 50 lbs. in three months. A few weeks before his admission he began to have, following his meals, severe colicky epigastric pain which lasted for several minutes. This pain then became more frequent until it had no special relation to his meals, but was aggravated by food, and finally it became so severe and so frequent as to require morphine. Moreover, he was afraid to eat because food exaggerated the pain. At no time did the pain radiate. There was no history of trauma. Personal and family history negative.

*Examination.*—Temperature 98°; pulse 72; respirations 18. The patient was in a decidedly weakened condition and very much emaciated. The abdomen was scaphoid. Respiratory movement was present. The recti were tense in the upper abdomen, and there was moderate tenderness just above the umbilicus. No masses could be palpated and the abdomen was tympanitic throughout. The lymphatic system was negative.

The urine was negative. The stools contained no visible or occult blood. Blood count: red blood cells 3,500,000; white blood cells 7,150; hæmoglobin 80 per cent. A barium series showed, in the six hour plate, marked distention of the small intestine, with a "step-ladder effect" due to partial obstruction. The diagnosis of partial intestinal obstruction was made, and operation advised and the patient transferred to the service of Dr. E. M. Eberts.

Under ether anaesthetic the abdomen was opened. From a point 6 inches above the ileocaecal valve and extending proximally for 2 feet, the ileum was purplish in colour. Here the bowel wall was greatly thickened and rigid, and in places covered with greenish yellow translucent material. The regional mesenteric nodes were enlarged. Resection and end-to-end anastomosis was done. Recovery from the operation was uneventful and the patient left the hospital four weeks later. Six

months later he was seen and was in good health. He eventually died outside the hospital from recurrence of the tumour, about eighteen months after the operation.

*Pathological examination.*—(S-27-423). The specimen consisted of approximately 70 cm. of ileum with its mesenteric attachment. The walls were thickened and oedematous. The mucosa presented a pebbled appearance and there were multiple areas of superficial ulceration. The regional mesenteric lymph nodes were firm, yellowish, varying from 0.5 to 1 cm. in diameter, and their cut surfaces bulged on sectioning. Transverse section of the bowel showed, macroscopically, marked infiltration of the muscularis with greyish yellow tissue.

Histologically, the mucosa was normal, except for areas of superficial ulceration which occurred between low papillae projecting into the intestinal lumen. These projections were the result of local aggregations of tumour cells in the submucosa, and were the cause of the pebbled appearance of the mucosa. The submucosa was largely replaced by tumour tissue which was not however of uniform structure. In some areas there were nests and cords of tumour cells, with little or no stroma, while in other areas there was a dense fibrous tissue in which there were a few tumour cells. From the submucosa columns of tumour cells were seen invading the muscular coats and producing a wide separation between muscle bundles. The tumour invasion extended through the muscular coats into the fatty tissue of the mesentery, which was thickened by local and diffuse tumour cell aggregations and by an increase of fibrous connective tissue. The structure of the mesenteric lymph nodes was completely obliterated by invasion with tumour cells. The peritoneum was normal.

The tumour cells generally, were small and varied somewhat in size. They were irregularly round with a small amount of clear cytoplasm and centrally-placed nuclei. The nuclei were round, but showed considerable variation in structure and staining reaction. The majority did not stain deeply, but, in these, central strands and granules and a peripheral chromaffin ring were to be seen. Other nuclei were homogeneous, deeply stained and had no visible detailed structure. In the more cellular areas there was a fine fibrillar stroma. In other areas the stroma consisted of fairly mature, though newly formed, fibrous connective tissue, which contained relatively few tumour cells. Diagnosis—lymphosarcoma.

#### CASE 7

(M.G.H., No. S-29-1644). Service of Dr. A. T. Bazin. G. McG., a male, aged 48, whose occupation was not recorded, was admitted complaining of a painful swelling in the calf of the right leg which had been present for about ten days. There were no symptoms referable to the gastro-intestinal tract, but he had lost 14 lbs. weight during the three weeks preceding his admission. There was no history of trauma. He had had typhoid fever in 1900. Family history negative.

*Examination.*—Temperature 98.4°; pulse 80; respirations 20. The patient was not particularly anæmic or cachectic. The abdomen was soft and moved well on respiration. In the right lower quadrant was a firm rounded mass, about 6 cm. in diameter, which was moderately tender. In the calf of the right leg was a hard indurated area about the size of an egg. Urinalysis was negative. Blood count normal; hæmoglobin 65 per cent. The patient remained under observation in hospital for four weeks, during which time he failed noticeably, ran a slight fever, and lost further weight. Exploratory laparotomy was then considered advisable. At this time the red cells were 2,850,000; leucocytes 22,100.

Under gas-ether anaesthesia the abdomen was opened, and a tumour involving the terminal six inches of the ileum and cæcum was found. From the gross appearance this was thought to be carcinoma

with secondary infection. Resection and anastomosis was carried out, with drainage.

No improvement occurred in the patient's condition following operation. He had persistent vomiting and later developed a faecal fistula. Nine days after operation he had a severe hæmorrhage from the abdominal wound. Following this he sank into coma and died within twenty-four hours.

**Pathological examination.**—(S-29-1644). The specimen consisted of 20 cm. of the terminal ileum, together with the cæcum and about 30 cm. of the ascending colon. The ileum was of about the normal circumference, but the walls were definitely hypertrophied. Commencing at the ileocaecal valve and involving the cæcum and first part of the ascending colon was a large irregular tumour mass, 10 cm. thick and 15 cm. long. It was very hard and appeared to involve only the bowel wall. Extending over the postero-lateral aspect of the mass, the appendix coursed upwards from the tip of the cæcum to the anterior surface of the ascending colon. At its base the appendix was 1.5 cm. in diameter. Towards its tip it gradually enlarged until it was 4 cm. in diameter. Near the base of the appendix was a sinus leading through the necrotic tumour into the lumen of the cæcum. The distal end of the appendix was involved in a large mass of the tumour which had grown into it. It was difficult to identify the appendix from the tumour in the mass, the normal tissues having been completely replaced. The wall of the tumour was from 1 to 4 cm. in thickness, and was composed of white and pinkish homogeneous, soft, friable material. At both ileal and colonic ends it had an overhanging margin. The colon distal to the tumour was dilated, being 11 cm. in diameter. At a point on its lateral wall, 6 cm. from the tumour, was a small papilloma, about 3 mm. in diameter. Only one or two lymph nodes were noted in the mesentery. They were of normal size and consistency.

Histological sections through the mass and including the appendix showed a portion of the appendix wall greatly dilated and thinned. In the lumen was a mass of tumour, while attached to the outer coats was another large tumour mass. Connecting these two masses of tumour through the appendix wall was a thin band of connective tissue. The tumour here, as elsewhere, was composed of a very delicate, but well vascularized connective-tissue framework. The tumour cells were of a uniform type. They were fairly large and rounded, with a moderate amount of cytoplasm. They were as a rule fairly undifferentiated in appearance, but mitotic figures were comparatively few. There were a few cells of giant dimensions, some of which were multi-nucleated. The upper and lower limits of the tumour were sharply demarcated. Sections of the lymph nodes showed no involvement with tumour. **Diagnosis**—lymphosarcoma.

**Autopsy findings.**—(A-29-277). The peritoneal cavity contains 600 c.c. of foul-smelling brownish fluid. The omentum was œdematous and rolled upon itself in the region of the anastomosis. Free pus escaped from the posterior surface of the liver, and, on exploring, a subdiaphragmatic abscess was found. The site of anastomosis had broken down and the edges were necrotic. The lumen of the distal colon contained fresh blood clots. No gross metastases were seen. There were no enlarged mesenteric lymph nodes.

Microscopically, careful search of many sections failed to reveal any tumour tissue in the mesenteric glands or bowel wall, nor was there any evidence of metastases found in sections of tissues from any organs. **Anatomical diagnosis**—generalized peritonitis; subdiaphragmatic abscess.

#### CASE 8

(M.G.H., No. S-31-249). Service of Dr. A. Stewart. R.C., a male, aged 55, whose occupation was not recorded, had been subject to chronic constipation for several years, but had otherwise been well till five weeks prior to his admission, when he first noticed

traces of fresh blood in his stools. Gradually this became more frequent and more pronounced. Shortly after this he developed a dull persistent pain in the lower sacral region which was aggravated by defæcation, often productive only of flatus. The anal region then became so tender that he could not sit on a hard chair. Finally, he developed a constant sensation of something in his rectum, which was unrelieved by defæcation. By this time anorexia, loss of strength, and loss of weight had been marked. There was no history of trauma. He had had typhoid fever in 1916. **Family history** negative.

**Examination.**—Temperature 99°; pulse 88; respirations 20. There was moderate pallor and emaciation. The abdomen was rounded and some fullness noted, but it moved freely on respiration. There were no rigidity, tenderness nor palpable masses, and the percussion note was tympanitic throughout. An inch and a half from the anal orifice the finger encountered a hard ridge of tissue in the posterior wall of the rectum, which extended up beyond the tip of the finger, and apparently occupied the whole sacrococcygeal concavity, and greatly narrowed the rectal lumen. The mass was nodular and firmly fixed to the sacrum, but did not extend round to the anterior wall. The mucosa over it was intact, but firmly adherent. There was no demonstrable glandular enlargement.

The urine was negative. The Wassermann test was negative. Blood count normal; hæmoglobin 75 per cent.

A barium enema was given. The rectum did not fill well and a part of the sigmoid was not filled with the barium. The cæcum and colon filled and emptied well. Proctoscopic examination revealed a tumour 8 cm. from the muco-cutaneous junction, involving the posterior three-quarters of the circumference of the rectum. It was fixed to the hollow of the sacrum, fungating, and bled freely.

Operation was considered advisable. Under high spinal anæsthesia a Lockhart-Mummery excision of the rectum was carried out, and the lower end of the proximal freed stump brought down into the wound. Radium was used. Post-operative recovery was uncomplicated and the patient was discharged from the hospital, four weeks later. He died in about six months from intercurrent pneumonia.

**Pathological examination.**—(S-31-252). The specimen consisted of the anus and rectum, measuring 18 cm. long. On opening the specimen a circular soft mass was exposed, which involved the whole circumference of the bowel except a narrow strip on the anterior surface. The edges of the tumour were heaped up and irregular, while its surface, except in the centre, was covered by adherent mucosa. In the centre was a small deeply ulcerated area with shaggy edges and necrotic base. On section, the tumour mass was seen to be composed of tissue the same colour and consistency as formalin-hardened brain tissue. This involved the whole thickness of the bowel wall, except the mucosa, and extended through the serosa in places into the surrounding fat. Fine bands of connective tissue were seen to separate it into lobules. When spread out the whole tumour measured 12 by 12 cm. and was 4 cm. in thickness.

Many microscopical sections were studied from various parts of the tumour. The margin of the tumour was rather abrupt. Beyond the margins the rectum was normal, except for engorgement of blood vessels and some hypertrophy of the mucosa. Within the margins the tumour cells were seen to involve all coats of the bowel except the mucosa, which was elevated. The submucosa was extensively infiltrated, thickened, and replaced by wide bands of tumour. The muscularis was diffusely infiltrated with tumour cells and in the centre of the tumour was represented only by thin bands and strands widely separated by masses of tumour cells. External to the muscularis, tumour invasion had largely replaced the serosa and fixed tissues extending in all directions into the peri-rectal fat. A few more peripherally isolated collections of

tumour cells were seen in the perivascular lymphatics and surrounding fat.

For the most part the tumour was composed of closely packed masses of small round cells with scant pale-staining cytoplasm, arranged in a scanty stroma of connective tissue with thin walled blood vessels. In some sections wider bands of collagen were seen and numerous phagocytic cells. Areas of necrosis of the tumour were here and there encountered. The nuclei were, for the most part, vascular, and contained an abundance of chromatin which stained deeply. A few were very dense, compact and pyknotic. The nuclear membrane was generally distinct and no definite nucleoli were seen. Mitotic figures were scarce. With Laidlaw's reticulum stain

no intercellular tissue was seen. Diagnosis—lymphosarcoma of the rectum.

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## SPONTANEOUS SUBARACHNOID HÆMORRHAGE\*

(WITH REPORT OF TWELVE CASES)

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IN the two-year interval between July 1, 1930, and July 1, 1932, 47 cases of cerebral hæmorrhage were admitted to the medical service of the Toronto General Hospital. This group of cases does not include traumatic hæmorrhage, hæmorrhage into cerebral tumours, or hæmorrhage associated with systemic diseases. The cases may be classified anatomically as in Table I.

TABLE I

Cerebral hæmorrhage: 47 cases admitted to medical service, Toronto General Hospital, between July 1, 1930, and July 1, 1932.

Origin of hæmorrhage	No. of cases	Result of treatment	Comments
In cerebral hemispheres	30	3 recovered 27 died	13 came to autopsy
In subarachnoid space	12	6 recovered 6 died	4 came to autopsy
In cerebellum	4	4 died	All came to autopsy
In brain stem	1	1 died	No autopsy

The two important points which emerge from these statistics are: (1) the high proportion of cases of spontaneous subarachnoid hæmorrhage (25 per cent); (2) the relatively good prognosis in this condition as compared with hæmorrhage originating in the substance of the brain. It is, therefore, of great importance that spontaneous subarachnoid hæmorrhage be recognized when it occurs, so that proper treatment can be instituted, and I will attempt a brief discussion of the subject with particular reference to this group of cases.

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Read before the Academy of Medicine, Toronto, January 10, 1933.

The subarachnoid space is bounded above by the arachnoid membrane and below by the pia mater. The former lies in apposition with the inner layer of dura mater, whereas the latter closely envelopes the brain and spinal cord. The subarachnoid space is in communication with the ventricles in the interior of the brain, and contains cerebrospinal fluid and the cerebral arteries. Rupture of an artery on the surface of the brain, at the base or vertex, results in bleeding directly into the subarachnoid space, and the blood will be intimately mixed with cerebrospinal fluid. This is called spontaneous subarachnoid hæmorrhage. This type of cerebral hæmorrhage must be distinguished from bleeding originating in the substance of the brain, which progresses to rupture into the ventricles or directly into the subarachnoid space. When this occurs, the cerebrospinal fluid is of no aid in distinguishing intracerebral hæmorrhage from spontaneous subarachnoid hæmorrhage but, in most instances, they can be differentiated by the nature of the onset, findings on examination, and the clinical course. It will be evident why the prognosis is very different in the two types of hæmorrhage. In intracerebral bleeding there is great destruction of brain tissue; whereas, in spontaneous subarachnoid hæmorrhage the bleeding is entirely outside the brain and the effects produced are chiefly mechanical.

Spontaneous subarachnoid hæmorrhage may occur at any age from childhood to senescence, but studies of large groups of cases show it to be most frequent between 25 and 40 years of

age. While time will not permit a full discussion of the underlying pathology, it may be stated that in young people a common finding at post-mortem is a macroscopic aneurysm at the point of rupture. These aneurysms occur most commonly at the junction of two arteries in the circle of Willis and it is believed that they represent a congenital defect of the arterial wall. In older persons, arteriosclerosis is probably responsible for the hæmorrhage in most instances. Strauss, Globus and Ginsburg<sup>1</sup> give autopsy reports of 11 cases, in all of which generalized or focal arteriosclerosis of the cerebral vessels was present. Macroscopic aneurysms were found in 7 cases and microscopic defects in vessel walls of the remainder. In 2 of the latter the defects were regarded as microscopic aneurysms. It is questionable if the aneurysms in arteriosclerotic vessels precede the vascular disease or are a result of it. Schmidt,<sup>2</sup> in a pathological study of 23 cases of intracranial aneurysms, considered 11 to be arteriosclerotic and 5 congenital in origin.

There is general agreement that syphilitic arteritis is very rarely the cause of subarachnoid hæmorrhage. The reason for this is obvious when one considers that syphilis affects the small arteries producing an obliterative type of endarteritis. Turnbull<sup>3</sup> and others have stressed the infrequency with which syphilis causes an intracranial aneurysm. Subacute bacterial endocarditis is an occasional cause of subarachnoid hæmorrhage through rupture of a mycotic aneurysm in one of the cerebral arteries. The rôle of infections generally in the production of subarachnoid hæmorrhage is not yet well understood, but it is probable that infection is a factor in certain cases. In common with other observers, we have noted that not infrequently the onset of bleeding is preceded by such symptoms as head colds, erysipelas, periods of chronic ill health, boils, etc. Examination of the brain in these cases usually reveals no evidence of inflammatory change, and it remains to be shown whether the infection may cause a local arteritis or whether the symptoms preceding the hæmorrhage are purely adventitious. It may be stated that "hæmorrhagic encephalitis" or, as Alpers<sup>4</sup> more correctly describes the pathological appearance, "medullary perivascular necrosis" is a comparatively rare cause of subarachnoid bleeding.

Regardless of age, the syndrome associated

with spontaneous subarachnoid hæmorrhage is fairly constant. Typically, it consists of sudden onset of severe headache followed soon by collapse, with or without loss of consciousness. In favourable cases, if consciousness is lost it soon returns, but the headache persists and is accompanied by pain in the back of the neck, vomiting, drowsiness, mental dullness, and occasionally convulsions. Examination soon after the onset usually shows meningeal signs dominating the picture. Only exceptionally is there paralysis of any limb, but quite frequently some cranial nerve palsies are present—chiefly ocular. The reflexes are often altered, either increased or diminished. A fairly common finding is very active reflexes in the upper limbs and diminished reflexes in the legs. Occasionally the Babinski reflex is positive on both sides. Lumbar puncture, done within a few days of the onset, shows bloody fluid in proportion to the degree of hæmorrhage. If there is only one hæmorrhage, daily punctures show fluid brownish, then yellowish in colour, becoming clear in less than two weeks. If the bloody fluid is not removed, a mild irregular fever is usually present for some days after the onset.

The following are synopses of the 12 cases of spontaneous subarachnoid hæmorrhage.

#### CASE 1

B., female, aged 30 years. *Past history*.—Chiropractic treatment for seborrhœa 2 days before. *Mode of onset*.—Awakened at night; severe headache; vomiting; unable to open left eye; pain in back of neck. *Examination*.—Three weeks after onset: stiff neck; Kernig +; complete left 3rd nerve paralysis; cerebrospinal fluid bloody; white blood cells, 16,000. *Course*.—During 3 months in hospital 4 recurrences subarachnoid bleeding. *Comment*.—No recurrences since discharge in March, 1931. Third nerve palsy greatly improved.

#### CASE 2

C., male, aged 31. *Past history*.—Fall three weeks ago; dislocated shoulder; no head-injury. *Mode of onset*.—Bending over: seized with severe headache; later, vomiting; drowsy; stiff neck. *Examination*.—Two days after onset: confused; stiff neck; Kernig +; cerebrospinal fluid bloody; white blood cells, 13,000. *Course*.—During 5 months in hospital 2 recurrences with diplopia and right knee-jerk increased. *Comment*.—Complete recovery: no symptoms since discharge.

#### CASE 3

D., male, aged 48. *Past history*.—Admitted to hospital with erysipelas facialis. *Mode of onset*.—When recovering became suddenly unconscious. *Examination*.—At onset: cyanosed; slow irregular respirations; pupils small and inactive; left 7th nerve paralysis; bilateral Babinski; arteriosclerosis ++; blood pressure 176/110; cerebrospinal fluid bloody. *Course*.—Died about 12 hours after onset without regaining consciousness. *Comment*.—Post-mortem: marked cerebral arteriosclerosis with multiple aneurysms; subarachnoid hæmorrhage from rupture of aneurysm on left middle cerebral artery.

## CASE 4

S., female, aged 48. *Past history.*—Under treatment for hypertension 2 years. *Mode of onset.*—Severe right-sided headache, drowsiness and dizziness. *Examination.*—Three days after onset: confused; neck stiff; right 5th nerve and left 7th nerve paresis; arteriosclerosis ++; blood pressure 230/110; cerebrospinal fluid bloody; white blood cells, 14,500. *Course.*—Steady improvement; discharged 3 weeks after admission. *Comment.*—Complete recovery; no recurrence since discharge June, 1932.

## CASE 5

P., female, aged 49. *Past history.*—Two previous similar attacks, 2 and 4 years ago, with complete recovery. *Mode of onset.*—Severe frontal headache for 1 week followed by convulsions. *Examination.*—One week after onset: dull mentally; retinal hæmorrhage; cerebrospinal fluid canary yellow. *Course.*—Progressive improvement; discharge 3 weeks after admission. *Comment.*—No recurrence since discharge, June, 1932.

## CASE 6

K., female, aged 53. *Past history.*—Headache and dizziness for 3 weeks. *Mode of onset.*—Severe headache; collapse; unconscious for 12 hours; then headache, vomiting and drowsiness. *Examination.*—Twenty-four hours after onset: drowsy; occipital headache; pupils unequal; neck stiff; Kernig +; hyporeflexia in left leg; cerebrospinal fluid bloody. *Course.*—Progressive improvement to complete freedom from symptoms 3 weeks after admission. *Comment.*—No recurrence since discharge, July, 1932.

## CASE 7

T., female, aged 53. *Past history.*—Nothing significant. *Mode of onset.*—Severe headache on arising in morning: convulsions. *Examination.*—Eight hours after onset: restless; semiconscious; stiff neck; hyporeflexia in legs; arteriosclerosis ++; cerebrospinal fluid bloody. *Course.*—Improvement for 2 weeks, then became confused; comatose; convulsions; died; cerebrospinal fluid faintly yellow. *Comment.*—No post-mortem; presumed to have had bleeding into clot at base of brain.

## CASE 8

V., male, aged 54. *Past history.*—Nothing significant. *Mode of onset.*—Sudden severe pain in back of neck and frontal headache vomiting and mental confusion. *Examination.*—One week after onset: drowsy; restless; headache; photophobia; stiff neck; Kernig +; hyporeflexia in legs; cerebrospinal fluid canary yellow. *Course.*—Progressive improvement. Discharged free of symptoms 1 month after admission. *Comment.*—No recurrence since discharge, October, 1931.

## CASE 9

K., male, aged 57. *Past history.*—Head cold for 3 weeks. *Mode of onset.*—Sudden onset of collapse at work, followed by unconsciousness. *Examination.*—Twelve hours later: semi-comatose; neck rigidity; reflexes absent in legs; arteriosclerosis +++; blood pressure 206/118; cerebrospinal fluid bloody. *Course.*—Forty hours after admission: died with broncho-pneumonia. *Comment.*—No post-mortem.

## CASE 10

F., female, aged 60. *Past history.*—Nothing significant. *Mode of onset.*—While undressing severe vertical headache; vomiting; neck rigid; hyperæsthesia of scalp. *Examination.*—Nine days after onset: restless, mentally dull; left ankle jerk not elicited; cerebrospinal fluid bloody. *Course.*—Suddenly developed right hemiplegia; recovered over night; bleeding continued; died in 6 weeks. *Comment.*—Post-mortem: massive subarachnoid hæmorrhage over base and vertex; cerebral arteriosclerosis +++; bleeding point not found.

## CASE 11

M., female, aged 65. *Past history.*—Six years ago, nausea; vomiting; stiff neck; pyramidal signs left leg; retinal hæmorrhages; complete recovery in few weeks. *Mode of onset.*—Sudden collapse with unconsciousness. *Examination.*—Six hours later: deeply unconscious; right hemiplegia; bilateral Babinski; arteriosclerosis +++; blood pressure 188/90; auricular fibrillation; cerebrospinal fluid bloody. *Course.*—Died 24 hours after onset without regaining consciousness. *Comment.*—Post-mortem: massive subarachnoid hæmorrhage from aneurysm on left anterior cerebral artery; hæmorrhage; lacerated left frontal lobe.

## CASE 12

H., female, aged 87. *Past history.*—None available. *Mode of onset.*—Found unconscious by police; no history. *Examination.*—Ten hours later: unconscious; early papilledema and retinal hæmorrhages both fundi; hyporeflexia in legs; bilateral Babinski; arteriosclerosis +++; blood pressure 170/90; cerebrospinal fluid bloody. *Examination.*—Died 72 hours after admission without regaining consciousness. *Comment.*—Post-mortem: massive subarachnoid hæmorrhage; cerebral arteriosclerosis +++; bleeding point not found.

TABLE II

## Summary

Principal symptoms at onset		Objective neurological findings	
	Cases		Cases
Headache	8	Meningeal signs	7
Pain in back of neck	4	Cranial nerve palsies	4
Vomiting	5	Alterations in reflexes	8
Loss of consciousness	5	Hyporeflexia in legs	3
Convulsions	2	Reflexes absent in legs	1
Drowsiness	3	Reflexes unequal in legs	3
Ocular disturbances	1	Hemiplegia	1
Hyperæsthesia of scalp	1	Bilateral Babinski sign	3
		Retinal hæmorrhages	2
		Papillædema	1
General systemic signs		Laboratory findings	
	Cases		Cases
Hypertension	5	C.S.F. bloody	10
Erysipelas facialis	1	C.S.F. xanthochromic	2
Mild fever during course of illness	5	W.B.C. elevated	3
		Wassermann negative	12
		Urine: albumin, trace; casts	4
			1
Post-mortem findings—4 cases			
			Cases
Advanced cerebral arteriosclerosis			4
Bleeding due to rupture of an aneurysm			2
Bleeding point not found			2

It will be noted that in favourable cases the duration of the illness is usually a few weeks, unless there is recurrence of the bleeding. This complication cannot always be avoided, but correct treatment lessens the chances of its occurrence. Unfavourable cases are those in which bleeding is severe at the start. Consciousness is usually lost early and not regained before death. Occasionally patients will appear to be responding well to treatment, then sud-

denly an exacerbation of symptoms occurs which proves fatal. This was seen twice in the series of cases recorded above. It is evident, therefore, that the prognosis is doubtful in all cases of spontaneous subarachnoid hæmorrhage, and this applies not only to the immediate future but to the ultimate prognosis as well. In Case 5 three hæmorrhages occurred at two-year intervals. In Case 11 the fatal hæmorrhage took place six years after a similar attack from which there was a complete recovery.

Meningitis and intracerebral hæmorrhage are the two commonest difficulties in diagnosis. The appearance of the patient often suggests meningitis, but the sudden onset in a person otherwise perfectly well, the disproportion between the degree of fever and the severe prostration, and the bloody cerebrospinal fluid lead to a correct diagnosis. In this regard, however, it should be noted that several days after the hæmorrhage occurs the cerebrospinal fluid usually contains a considerable number of mononuclear cells per cubic centimetre. These cells are in response to the disintegration products of hæmoglobin, and must not be mistaken for the indication of an infective process in meninges or brain.

The predominant feature in a case of intracerebral hæmorrhage is the evidence of local destruction of cerebral tissue, *e.g.*, hemiplegia. When, as commonly happens, the hæmorrhage has ruptured out so as to produce bloody cerebrospinal fluid the patient is deeply unconscious and death is close at hand. In the usual case of spontaneous subarachnoid hæmorrhage the signs of local damage to the brain, if present, are confined to cranial nerve palsies. If hemiplegia or monoplegia occurs, it usually develops some time after the onset and is not likely to be very severe. Case 11 is an exception to this rule, and accordingly presented great difficulty in differentiation. Here the blood from an aneurysm on the left anterior cerebral artery ruptured into the left frontal lobe, causing a right hemiplegia.

Occasionally, in a case of subarachnoid hæmorrhage with ocular palsies, the question arises whether the underlying condition is an encephalitis. The sudden onset without premonitory symptoms, the absence of fever at the start, the improvement after lumbar puncture, and the absence of sequelæ are all evidence against encephalitis being the cause of the hæmorrhage. It is very uncommon at the present time to see a case of acute encephalitis

lethargica, either clinically or at post-mortem, and the hæmorrhagic type of the disease which occurred when the epidemic was at its height has likewise disappeared. Other forms of encephalitis, notably those associated with the exanthemata, may occasionally give rise to diffuse subarachnoid bleeding, but in these cases the history and the symptoms prior to the onset of the hæmorrhage usually make the diagnosis possible.

Treatment consists in putting the patient to bed and keeping him perfectly quiet. Sedatives should be given freely for headache and general discomfort. It is our practice to carry out lumbar puncture daily at first, later every second day, until the cerebrospinal fluid is clear. About twenty cubic centimetres are removed, very slowly, at each puncture. Manometric readings are taken frequently, and the procedure is stopped if the pressure falls below 70 mm. of water, or if a rise in pressure occurs while the fluid is being removed. If the fluid is allowed to drain away rapidly the chance of causing recurrence of bleeding is increased. To prevent this we adjust the stylet so as to remove the 20 c.c. of fluid over a period of about one hour. In our experience this method of treatment gives very good results, but opinion regarding it is not unanimous. In some quarters, it is believed that no drainage should be done, lest it cause further hæmorrhage. However, clinical experience, together with Bagley's work<sup>5</sup> on animals, indicates that the foreign blood in the cerebrospinal fluid is toxic to the individual and liable to result in meningeal adhesions and cortical damage if not removed. I know of two cases in which severe mental symptoms followed subarachnoid hæmorrhage: in both cases only a diagnostic puncture had been done. Patients may be allowed to sit up about three weeks after their symptoms subside, but they should not be permitted to resume heavy work for at least two months. By this time organization of the clot at the point of rupture should be complete. Patients with hypertension should be kept in bed longer than those with normal blood pressure.

In conclusion, I should like to emphasize the following points.

1. Spontaneous subarachnoid hæmorrhage is a common type of cerebral hæmorrhage and

has a relatively good prognosis. It occurs at all ages.

2. The usual cause of the hæmorrhage is a defect in an artery of the circle of Willis. The defect is often aneurysmal, and may be congenital in origin or the result of arteriosclerosis. The rôle of infections is not well understood, but they probably play a part in the production of subarachnoid hæmorrhage in certain cases.

3. The syndrome is fairly clear cut in the majority of cases, the principal features being the sudden onset of severe headache, followed sometimes by loss of consciousness, vomiting, drowsiness, and mental confusion. On examination there are usually marked meningeal signs, possibly some cranial nerve palsies, but only

rarely hemiplegia or monoplegia. Reflex alterations are common, but often transitory. The cerebrospinal fluid is bloody for a few days after the onset, then changes to brown, and later to yellow, becoming clear about ten days to two weeks after the hæmorrhage.

4. Treatment consists in general measures to prevent recurrences of the hæmorrhage and repeated lumbar punctures, about 20 c.c. of fluid being drawn off very slowly on each occasion until the fluid is clear.

I wish to express my thanks to Prof. Duncan Graham for permission to publish these cases.

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### INFANT CARE\*

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THE child of to-day is the citizen of to-morrow. His burdens will be even greater than ours. To meet them successfully he will require a higher average of health of mind and body. Communities and governments which neglect to surround young children with such environment as will promote their optimum well-being, certainly take little thought for the future. Fortunately, even at this time of universal unrest and anxiety, the tide of public concern for the welfare of children is still rising.

The recognition of the claims of the infant and young child upon society for protection is a comparatively modern conception. Among the primitive peoples the imperative necessity for immediate self-preservation often led to the planned destruction of infants which might hamper the progress of the tribe on the march or in war. In Egypt, where, because of the mild climate, the cost of raising children was negligible, the lives of infants were usually spared. Egyptian laws have been found dating back 4,000 years requiring a husband to care for his wife and children. Early records from China depict a pastoral people who reared chil-

dren carefully. At a later period, both in China and in India, the pressure of population and threatened famine favoured widespread infanticide. Exposure of unwanted infants was practised in Greece and in Rome and by contemporary nations, although several emperors of Rome, including Augustus, Trajan and Marcus Aurelius, did much to encourage the preservation of children. Among the peoples whose history extends into the remote past, the Jews have been conspicuous in the care of their offspring. Among Mohammedan nations the wilful destruction of infants was checked by mandate of the Prophet. With the advent of Christianity the Church Fathers frequently protested against the widespread infanticide and cruelty to children. Later, the great figure of St. Vincent de Paul emerged as a stern champion of the defenseless babe.

The abuse of child life, which accompanied the introduction of steam-run machinery and the rise of factory life, darkened the record of industrial development in many countries notably in England and to a lesser extent in New England. The reforms of Lord Shaftesbury and others resulted from an aroused public protest and did much to lessen commercial exploitation of children.

\*Read at the Annual Meeting of the Canadian Medical Association, Toronto, June 24, 1932.

In all these centuries, while there were certain asylums and homes for the reception of abandoned and neglected children, there was little general appreciation of the value of child life or any organized effort to conserve it. The first crèche or day nursery was opened in France in 1848. In England, a few years later, the enormous loss of human life, through the deaths of infants, was brought officially to the attention of the English Government in reports by Sir John Simon and later by Sir William Farr, Adviser to the Registrar General. Shortly after this, investigations undertaken in France disclosed a startlingly high infant mortality, especially among children boarded out as wards of the State. These studies attracted wide attention in both medical and political circles. Further investigation showed that the loss of life occurred for the most part among babies deprived of proper food and care. How to assist and instruct the mother was the problem.

A few years afterwards it was shown by Herrgott in Nancy and Budin in Paris, that the high infant mortality rate could be amazingly reduced by periodic examination and supervision of infants born in obstetrical clinics, together with instruction of mothers on the value of breast nursing and individual care. At the same time, from 1890-1894, Gouttes de Lait, or milk stations, were established by Variot in Paris and Dufour in Fécamp. In addition to the examination of the infant and advice to the mother, clean milk was supplied at these stations for infants who could not be nursed at the breast. The introduction of milk stations and child health centres and consultations in many parts of the world and the beginning of the modern infant welfare movement can be traced directly to the demonstrations of Herrgott and Budin, of Variot and Dufour.

It is to be noted that in this new field, as in others, the plan had its beginning in the minds and hearts of individuals, and the support of the undertaking came from private organizations. These pioneers blazed the trail; they showed that babies can be saved through the instruction and assistance of their natural caretakers, their mothers. As a result of these early activities, infant welfare stations as they were frequently called, were opened in many countries. The attention of health depart-

ments was attracted to the problem and they began to include in their programs specific appropriations and measures for the prevention of infant mortality and the promotion of the health of mothers and infants. Throughout the civilized world, maternal and infant death rates are now recognized as matters of special concern for both official and voluntary agencies. So far has the education of the public progressed in these matters that even the laity appreciate the fact that an excessive maternal or infant death rate is the most sensitive index we possess of social welfare and public health administration.

In these forty years many contemporary developments have come to the assistance of the baby. Much progress has been made in medicine including pædiatrics, both in research and practice. Bacteriology and chemistry, and the science of nutrition have greatly increased our knowledge of the needs of the infant's body. Sanitary dairy farming has been introduced; the professionally trained nurse, both in private practice and public health has become recognized as perhaps the most efficient agency in rendering aid to the mother in keeping her infant well. The vitamins have been discovered and the value of sunlight and fresh air are better understood. The early notification of births, first employed in Huddersfield, England, which made possible the prompt visiting of the home, is now a frequent practice. This knowledge and improved practice have saved many lives. In the English speaking world, the fundamental studies of such sanitarians as Sir Arthur Newsholme and Sir George Newman have helped to centre attention upon infant hygiene as the most hopeful field for public health endeavour.

In the United States and Canada, the modern campaign to reduce infant mortality received its impetus in part from the results obtained in Europe. The introduction in 1893 of pasteurized milk for infant feeding in and about New York City by Nathan Straus was one of the first steps. Soon afterwards in many of the larger cities infant welfare stations were started. At first clean milk was distributed at these stations but later, as the quality of the commercial milk improved, this was discontinued and effort was concentrated on instruction of the mother. It was gradually realized that the essential services of the consultation

consisted in the thorough examination of each infant by a skilled physician, his intimate personal talk with the mother and the follow-up visit in the home by the nurse.

A great stimulus to the infant welfare movement in the United States resulted from the publication in 1906, by the United States Bureau of the Census, of the Report on Infant Mortality, which showed in approximate figures the enormous annual loss in infant lives the country was sustaining. The desirability on the part of the rapidly forming volunteer organizations to meet and discuss methods and plans for conserving infant lives soon became apparent and at a meeting under the auspices of the American Academy of Medicine, in New Haven, Connecticut, in 1909, a new association was organized,—The American Association for the Study and Prevention of Infant Mortality. In the formation and work of this Association, our friends in Canada were prominently represented. Dr. Helen MacMurchy, in whom the defenseless baby has had through many years an effective champion, was from the beginning an honoured member and counsellor. Between its annual meetings the Association carried on important research and investigation. Its office was a storehouse of information on child hygiene, freely drawn upon by all interested. The volumes of its proceedings include the best contemporaneous thought on infant and child hygiene in the country.

In 1918 the parent organization changed its title to that of the American Child Hygiene Association and concentrated its activities more particularly on health education, a movement sponsored by the distinguished pædiatrician, L. Emmet Holt. It still continues its useful services as the American Child Health Association to which the name was changed in 1923.

The quickening interest in the mother and young child throughout the country resulted in the establishment in 1912 of a Federal Children's Bureau in the United States Department of Labour under the distinguished direction of Miss Julia Lathrop. Under her leadership a series of important investigations was made in widely separated fields, upon the effect of economic and industrial conditions, such as family income, crowded housing, the employment of mothers away from home, the study of the results of breast versus bottle

feeding, and many other problems influencing the health of infants.

The establishment of the United States Registration Area for Births in 1915 marked another important milestone, for it enabled the United States to begin an accurate statistical comparison of infant mortality rates with other progressive countries. The World War, with its staggering toll of human life, directed attention to the importance of the conservation of child life. The entrance of the United States into the conflict naturally increased the sympathetic consideration in the United States of the needs of its future citizens; 1918 was declared Children's Year, at the suggestion of the Children's Bureau in cooperation with the Child Conservation Section of the Council of National Defense. During the year over five million infants and children were examined by physicians and a large proportion of them were found to be below satisfactory standards in development, or to be handicapped by some physical defect and often without medical supervision. One of the results of the findings was the passage by Congress in 1921—notwithstanding pronounced opposition—of the Sheppard Towner Bill, making available to the several States, grants of Federal money if matched by equal sums by the States themselves. This led to the establishment of Bureaus of Child Hygiene in the various State Health Departments where they did not already exist. These bureaus were charged with the duty of studying and promoting the health of mothers and young children.

Mention should also be made of the impetus the welfare of mothers and children received from the three great White House Conferences convened by Presidents Roosevelt, Wilson and Hoover in 1909, 1919, and 1931, respectively. In them the existing condition of the nation's children—the environment in which they were born and reared—was discussed by those best qualified to speak, often after long and pains-taking investigation, and definite proposals were recommended for the future.

Acknowledgment should be made, too, of the debt that all workers in child hygiene feel for the liberal grants received from philanthropic foundations and individuals. These have made possible the study of various methods of promoting the welfare of children—often demonstrating, in selected localities, the results obtained from increased facilities—and have en-

couraged communities to continue afterwards a higher standard of child care.

Infant welfare has now become recognized as such an important part of a public health program that its problems and administration have been intensively studied by general sanitarians and teachers of hygiene in our schools and colleges and by experts in the United States Public Health Service where for more than a score of years many studies on subjects affecting the health of children, have been carried on.

One of the most valuable agencies in spreading the knowledge of infant care in the United States has been the child health conference or consultation, conducted at times in an established health centre or in various other places—school, home, church, doctor's office. The survey made of such centres for the White House Conference indicated that there are upwards of 1,500 permanent child health centres, more than 630 supported by volunteer organizations, about 650 by official agencies, and 232 cooperative child health centres which receive support from both sources. Most of these centres are in or near the larger cities. In addition, more than 6,000 child health consultations are being conducted each year under the auspices of the Bureaus of Child Hygiene in the State Departments of Health. It is estimated that more than 1,250,000, or approximately one-tenth of all the children in the United States are reached annually in these child health centres. It is interesting to observe that 1 per cent of the permanent child health centres were established prior to 1900, that over half were begun since 1920 and 87 per cent since 1910.

Child health centres may be looked upon, perhaps, as temporary measures which express the desire of individuals and officials to bring immediate assistance to the baby. It is probable that they will not be so necessary when the medical profession as a whole gives more time and thought to the active promotion of health as compared to diagnostic and curative practice.

The widespread distribution of information on all phases of infant hygiene has also been a fundamental factor in the reduction of infant mortality. Public lectures, radio talks, the cinema, mothers' classes, numbers of popular books, leaflets, magazine articles, secular and professional and the press have repeatedly told the story and come to the aid of the mother in helping her care for her child.

Of great value too, has been the increased interest of the general practitioner in preventive pædiatrics, in keeping well children well. As a group, the children's doctors have led the way in the development of this form of preventive medical practice.

The underlying causes of the unnecessary deaths of infants are poverty, ignorance and neglect on the part of parents or guardians. Responsibility for adequate care of the child rests first upon the mother and father and then upon the community itself. John Dewey says "what the wisest and best parent desires for his child, that must the community desire for all its children."

Child hygiene, then, is a part of a general health program. It is difficult to attain it in an insanitary home where parents are indifferent and neglectful. On the other hand, the condition of the infant is influenced favourably by any improvement in general sanitation. Proper disposal of sewage, clean milk and protected water supply, improved housing conditions, public parks and similar factors, of themselves promote infant welfare.

The acute immediate problem in the United States is to devise procedures by which all children from birth through their early dependent years—irrespective of their race, and the financial status of their parents—may have periodic preventive advice and proper nourishment. Families of independent means will usually obtain this service from private physicians at their regular charges. The needs of the children of the dependent and indigent groups are partly met in our cities through child health centres and hospital dispensaries. On the other hand, the provision of similar services in the rural areas and smaller towns in the United States is lamentably deficient for the children of parents of limited means. The family with little income, or one barely sufficient for daily needs, has to rely upon the good will of a busy practitioner for medical services. Frequently these services are given adequately and gladly but at best it is a haphazard plan which cannot encompass all the infants of the poor. It is among children of this group that the large incidence of disease and death occurs. If this unnecessary loss is to be lessened, provision for the preventive care of infants and young children must be provided as a community project. When the duty of providing

preventive care for its necessitous infants is assumed by a community, its officials will arrange with the local medical profession—perhaps through the county societies—to provide a place and a weekly period where the children of parents of limited means can be examined and treated and the doctor will receive compensation from public funds.

In some counties in my own State, the members of the County Medical Society have set aside a definite hour each week, or fortnight, when they see in their offices, without pay, the children brought in by nurse or social worker. These physicians should receive some return from the county treasury. The fact that free education has been offered to all children has not appreciably retarded the establishment of an increasing number of private schools maintained by those who are willing to pay their charges. For the same group the private physician will always be sought. Experience has shown that an increasing number of families of smaller resources, who have seen the value of preventive advice for their children in the public conferences have become willing to make the necessary sacrifice to pay their own doctors for similar services.

The extent of the salvage of infant life in the United States in the last quarter of a century, most of it in the last fifteen years, may be briefly indicated by the following figures. In 1906, with an approximate total population of 85,000,000 there were about 275,000 deaths of infants under one year or 324 per 100,000 population. In 1915, in a population of 99,000,000, there were 250,000 infant deaths or 250 per 100,000 population. In 1930 the population of the country had reached 122,000,000 and there were but 150,000 infant deaths or 120 for each 100,000 population. If the loss of infant lives per unit of population which took place in 1915 had pertained in 1930, there would have been 305,000 infant deaths instead of the actual 150,000—a salvage of 155,000 infant lives. That these infants were spared by better care and were not weaklings, designed by Providence for an early death, as has often been asserted, claiming that they were brought through their first year only to succumb shortly thereafter, is shown by a similar and coincident reduction in the mortality of older children. Some of this reduc-

tion is due to a decline in the birth rate. That it is not due in large measure to this cause, but comes from an actual salvaging of infant lives, is realized when we consider the reduction in terms of infant deaths in relation to live births, over a period of years. For instance, in 1915, in the United States, there were approximately 100 infant deaths to every thousand live births. By 1930, the number of deaths under one year had been reduced to 64 in every thousand live births. If our present knowledge of infant hygiene could be generally applied, no community in the United States or Canada ought to lose more than 50 infants in their first year in every thousand born alive.

These important steps in the development of infant welfare in the United States have been discussed, not because they were in any sense unique, but because the writer has had some personal knowledge of them.

The progress in child welfare in Canada has been phenomenal in many respects. Here, also, volunteer organizations in the cities blazed the trail and demonstrated the value of preventive care. These have been fostered and often consolidated by wise official action. In all the provinces of your immense territory local governments have recognized the importance of promoting child hygiene and have established for this purpose special bureaus or similar agencies. Your problems of administration are in some respects simpler than are ours south of the border when we have to deal with 48 sovereign and independent states. You have avoided some of our mistakes and we are now in turn taking heed, with profit, of your effective methods. Probably nowhere in the world is the administration of infant and child hygiene more successfully carried out than in the city of Toronto. I recall the zeal with which that beloved and wise Medical Officer of Health, the late Charles J. Hastings, discussed at many gatherings in the United States the activities of the Division of Child Welfare organized here in 1914. I am particularly impressed with the incorporation in the scheme of your outstanding Children's Hospital where, under Dr. Alan Brown and his associates, the physicians and nurses at the welfare stations are trained and where so much is being done through research and demonstration to raise the standard of pædiatric practice and child hygiene in this and other provinces of the Dominion. Men and

women have gone forth from this hospital to carry the gospel of child health not only to the city mother but to many remote and isolated homes.

It is interesting to note the reduction that has been brought about in the general infant death rate in Canada in recent years. The Department of Pensions and National Health of Canada, of which the Division of Child Welfare is a part, was created by an Act of the Canadian Parliament in 1919. The Division of Child Welfare was established in April 1920, with the appointment of its present chief, Dr. Helen MacMurchy. The infant death rate per thousand live births in Canada was 102 in 1921 and by 1930 it had been reduced to 89.

In the foregoing discussion of infant welfare the writer has not included one of its most fundamental aspects, namely, the care of the unborn child through the adequate care of the mother before, during and after labour. The value of this service—maternal welfare—the need of its further and general application has been emphasized by more authoritative words than mine. When we consider that nearly a half of the total infant mortality of the first year occurs in the first month, that the still-birth rate is approximately 10 per cent of the total number of births and realize too that the usual methods that have proved effective in safeguarding infants after the first month are of little value in reducing the neonatal deaths or in preventing the great loss from the incidence of death before birth, it is evident that those interested in child hygiene must join hands with the progressive obstetrician in every effort to conserve the health and life of the expectant mother.

The limits of this address on Infant Welfare also preclude more than a reference to two other important age periods in the life of a developing child, which should receive attention in a discussion of child hygiene, namely, the pre-school and the school period. Statistics show us that the runabout child furnishes nearly four-fifths of the deaths from communicable diseases that occur during the whole life span. This is a period too in which many of the remediable physical defects—rachitic bone changes, enlarged tonsils and adenoids, dental caries, and other abnormalities—occur. Most of these abnormalities develop slowly and can be prevented or corrected if they are detected

by physical examination and are promptly treated. Partly because such oversight is not given to the preschool children, a large proportion of them are beginning their long educational journeys, more or less physically handicapped.

The promotion of the health of the child of school age is a responsibility shared by both parents and teachers. Great progress has been made both in the sanitation of the school premises and in the medical examination and direction of school children, but adequate professional oversight is still sadly deficient in many rural areas.

And finally, a complete infant hygiene program projects itself far back into the antecedents of the child. No comprehensive review of infant welfare can begin after the birth of the child. More attention should be given to improving the quality of the material with which we have to deal and with an effort to strengthen gradually our racial stock. Every community is paying a fearful price for its neglect of the known facts of heredity. A breeder of animals is careful in the selection of the parents of his colts or calves. Charles Darwin has a striking sentence we would do well to heed. He asserts that "only in the case of man himself is anyone so foolish as to permit his worst animals to breed." It probably never will be practical for inheritance patterns to be a controlling factor in the choice of a young man for a maid. The course of true love does not run so smoothly, but the union of couples with known defective genes, which will result in defective or diseased children, is a crime against the race and furthers racial deterioration, and ought to be stopped wherever the facts are recognized.

The great desirability of improving the average quality of each generation of children imposes an obligation upon those parents who are sound in mind and body, not to unduly, and from selfish motives, restrict the number of their children.

These considerations in no way lessen our duty to provide the most favourable environment for the afflicted children in our midst, who must be sought out, diagnosed and cared for with the utmost skill and solicitude. If, however, this care, which motives of philanthropy and justice prompt, is given without a corresponding effort to prevent the repro-

duction of inherited debilities, we are only adding to the grievous burdens placed upon those who follow us.

The term "infant" implies a member of society who cannot speak for itself. Let us, however, imagine a baby endowed with supreme intelligence and power of speech. If we could address such a prodigy and inquire of it "What are the rights which you claim from the present generation to insure your mental and physical well being?" can we not hear the answer? He would reply: "If I and

other babies are to be equipped to play our parts successfully in our generation, we plead the right to be born of healthy parents who will not transmit to us disease and infirmity. We plead the right also to be properly fed, to be protected and reared in an environment favourable to our growing powers." The liquidation of these righteous claims is Infant Welfare. An informed and aroused public opinion and all responsible governments should speak and act for the inarticulate babe. They cannot with self-respect do less.

### ACUTE APPENDICITIS—SURGICAL DIAGNOSIS

By R. V. B. SHIER,

*Toronto*

ACUTE appendicitis has been written about at great length during the last two to three years. Many of the writers have presented statistics giving the end-results, and great benefit has come to the profession at large, because these statistics awakened us to realize that our results were not all that could be desired in the perforated cases. The question ever in the minds of those deeply concerned has been how to improve matters, and the answer undoubtedly lies in public education, earlier and more accurate diagnosis of the pathological process, and better judgment on the part of the operating surgeon.

Perhaps it may seem unnecessary to deal with methods of examination, but it would appear that most mistakes are the result of faulty methods. No one of us will be right all the time. Normal appendices will be taken out and a few left to perforate, but these occurrences will be few if an organized method of examination is adopted. It is just as essential to have a developed technique in making an abdominal examination as it is to have a developed technique in doing a blood transfusion or other surgical procedure. It is equally essential to remember that the pathological process produces the symptoms, and that tenderness as a symptom points to the area of pathological change.

The technique of examination which will be found satisfactory is as follows. While the patient is relating his symptoms, which should be without prompting from relatives, the ab-

domen should be exposed in a good light by folding the nightgown up to the nipple line and the bed sheet down to the level of the pubes. A point that really matters in the patient's story is that he stick to the proper sequence of events. If he does not do this he must be interrupted and told to do so by asking him what was the first thing he noticed wrong, and so on. While he is giving his version of the history of the case the examiner should inspect the abdomen, but should not under any circumstances lay a hand on it. At the conclusion of the patient's story ask him to do some deep breathing and move the abdominal wall up and down, and ask him if that movement hurts him, and if so where? Then take a pencil and test the abdominal wall for areas of hyperæsthesia. When this is done ask him to palpate his abdomen and pick out with one finger the most tender area. This last point is essential to success in diagnosis. Why is this so? First, because it is the last place on the abdominal wall where the examiner should place his hand, and, secondly, it points to the area of disturbance. Palpation should commence at the farthest point from this area. For example, if the most tender area is in the right iliac fossa palpation should commence in the left kidney or splenic area, and while palpating this adjacent region suddenly release the hand and note the presence or absence of rebound tenderness. From this point on gradually approach by a circuitous route the point of maximum tenderness, noting on the way the

edge of minimum tenderness, if any. However, the presence or absence of tenderness is not the only thing to be noted, because tumours or obstructive coils of small intestine may come under the palpating hand.

Having completed the examination thus far, examine for free fluid in the flanks and the presence or absence of liver dullness. Next examine the inguinal canal and the urethra, in the male, for discharge. Then ask the patient to sit up in bed, and test the kidneys by fist percussion, and finally make a rectal or vaginal examination, or both.

The only laboratory work really necessary, unless it be a flat x-ray plate in a case of suspected small bowel obstruction, is a leucocyte count and a urinalysis, which latter should always be that of a catheter specimen in the case of a female.

In considering the question of diagnosis it is important to realize that there are two pathological and three clinical types of the disease. To be more explicit, one may state that the pathological types are the diffuse inflammatory and the obstructive inflammatory. The three clinical types are: first, an acute process in the appendix with hyperæsthesia, but without release tenderness; second, the perforated appendix with localized peritonitis; third, the perforated appendix with general peritonitis.

As far as the pathology is concerned there are only two practical points to remember. These points are, first, that the obstructive form is much more painful than the diffuse, the pain resembling that of intestinal obstruction in that it is severe and colicky in type, and secondly, that the time of perforation is much shorter in the obstructive type than in the diffuse, which is just exactly as one would expect.

The importance of the recognition of the clinical types lies in the fact that it calls for judgment on the part of the operating surgeon as to how and when he will operate, as well as the technique to be employed at the time of operation.

All text-books contain excellent and painstaking descriptions of the symptoms and their sequence, but to wait until the text-book picture is present in order to make a diagnosis is to wait in many instances until perforation has taken place. Early nausea associated with circum-umbilical pain, or epigastric pain with tenderness over the site of the appendix, are

the most constant and earliest symptoms of appendicitis. This tenderness is an entirely different thing from the combination of tenderness and rigidity which occurs later on, for in the final analysis rigidity is not an early symptom of the disease. Early tenderness is the result of an inflamed appendix alone, and the later combination is the result of peritonitis, localized or diffuse, involving the parietal peritoneum, and when rigidity is present it is an indication that the appendix has already perforated or is near perforation. There is only one time when true rigidity is an early sign, and this is when the inflamed appendix lies against the parietal peritoneum. Another point to remember regarding this tenderness is that it is persistent and differs in this respect from the tenderness which comes with the onset of infectious diseases.

There are three sites for the appendix in which it takes fairly deep pressure to elicit tenderness: first, when the appendix is retro-cæcal; second, when it is hiding under and lies along the mesentery of the terminal ileum; and third, when it is pointing downward into the pelvis. When the appendix lies in any of these positions it is amply protected by a cushion of gas-containing viscera, and considerable pressure is necessary to elicit tenderness. One can nearly always predict the site of the appendix by the point of maximum tenderness which the patient points out.

The fourth most constant indication of an inflamed appendix is a leucocytosis. The count is usually from 14,000 to 17,000, and if perforation is present runs from 15,000 to 20,000, but it must be borne in mind that even with a gangrenous appendix one may find a normal white cell count, and this circumstance can only be explained by some lack of reaction peculiar to the individual. If the leucocyte count is above 20,000 one must be careful to rule out intraperitoneal hæmorrhage, pyelitis and Neisserian infection.

The fifth most important indication of the inflammatory process is elevation of the pulse rate, which to my mind is of a great deal more importance than elevation of temperature. The temperature in the first 24 hours ranges from normal to 101°, but rarely if ever does one see a temperature above 102° in the first twenty-four hours, and if it is above 102°, one must be suspicious of some other cause for it.

Perforation of the appendix causes absence of the initial skin hyperæsthesia, and, in addition to aggravation of all the foregoing findings, a very definite rigidity is added, which is true in type and is present during both inspiration and expiration.

If it were not for the fact that in its early stages appendicitis does sometimes resemble other diseases, and that these in their turn may resemble appendicitis, and also for the fact that occasionally both may be co-existent, we would have few worries in making an accurate diagnosis. In considering differential diagnosis here it is understood that other signs pointing to appendicitis, or pointing to the diseases under consideration, are in evidence and that the points of importance dealt with here are considered as a deciding factor in arriving at a positive diagnosis in difficult cases.

The usual conditions which come up for differential diagnosis are infectious diseases, lesions at the base of the right lung, right-sided kidney lesions, perforated ulcer in stomach or duodenum, acute gall bladder disease, intestinal obstruction, epididymitis in the male, and salpingitis in the female.

The existence of *infectious diseases* in their early stages is difficult to eliminate. The important point to be borne in mind in regard to their onset with pain and tenderness in the right side of the abdomen is that the tenderness is diffuse in type, and that no persistent point of maximum tenderness is present. At one moment the patient states the tenderness is more noticeable at one point, and in a moment or so will say the area has changed, while in appendicitis the appendix is the point of maximum tenderness and as its position is constant the point of tenderness is constant and persistent. Change of position often modifies tenderness in infectious diseases, and if changing the position aggravates it the tenderness is more likely to be of somatic origin than due to an intra-peritoneal inflammation. While speaking of pain and tenderness it should be remembered that tenderness is a much more marked symptom in appendicitis than pain, although we do occasionally see a case of obstructive appendicitis where pain is the predominating factor, but this is not the rule. In general infections pain is more prominent than tenderness.

The next condition which causes difficulty is

*right renal calculus* or *calculus in the right ureter*, with or without pyelitis, and *pyelitis* with or without calculus. The reason for this is that in addition to right-sided pain and tenderness there is commonly reflex abdominal distention, which has a tendency to detract one's attention from the kidney to some intra-peritoneal lesion. In any lesion which causes obstruction to the flow of urine, or is producing an inflammatory condition in the pelvis of the kidney, the point of maximum tenderness is in the kidney and is best demonstrated by fist-percussion. A retrocæcal appendix lying on the surface of the right kidney very closely simulates a pyelitis, and indeed both may be co-existent, but fist-percussion of the kidney, while it gives definite tenderness and causes the patient to complain of pain in true pyelitis and calculus obstruction, does not give this symptom in a retrocæcal appendiceal inflammation. The other points which help in a differential diagnosis between a right-sided kidney lesion and appendicitis are, of course, the leucocyte count, which in pyelitis is usually quite high, a higher elevation of temperature at the onset of the disease, and the urinalysis, which should always be an analysis of a catheter specimen in the female.

While *epididymitis* in the male is readily excluded by examining the urethra and palpating the testicle, yet *salpingitis* in the female is sometimes an entirely different problem. In most cases of acute salpingitis the attack commences three or four days after the termination of the menstrual period, and the tenderness is equally bilateral, because the disease is usually bilateral. The leucocyte count is usually very high, and in the first twenty-four hours the temperature is in excess of that found in appendicitis. In a case of acute inflammation of an appendix which is situated in the pelvis the tenderness is unilateral, and, here again, I think the single point of maximum tenderness is much more definite, with acute inflammation of the pelvic appendix, and usually, in salpingitis there are bilateral points of maximum tenderness. There is also a great deal more pain on moving the uterus in salpingitis than in a case of appendicitis.

Another fairly common condition is *intra-peritoneal hæmorrhage*. It must be borne in mind that a very trivial abdominal injury may result in extensive abdominal hæmorrhage. One or two other conditions which may closely simulate appendicitis are *ruptured ectopic gesta-*

tion in its early stages, and *ruptured lutein cyst*. In both these conditions there is a peculiar sensitiveness in the abdominal wall caused by the intraperitoneal bleeding, the leucocyte count is high, while in the case of a ruptured ectopic gestation the history and other symptoms may point to pregnancy.

Occasionally the material leaking from a *perforated duodenal ulcer*, instead of finding its way down over the front of the omentum, gradually drops down over the side of the abdomen between the peritoneum and the ascending colon giving only right-sided tenderness and rigidity. In cases such as this we have to depend on the history of previous indigestion of the duodenal ulcer type, the presence of free fluid in the right flank, and the fact that tenderness exists over a considerable area of the right side of the abdomen and is about equal in intensity in all parts involved. It is rarely that free fluid can be demonstrated in the abdomen in an attack of acute appendicitis. Another point to be borne in mind in a case of perforated duodenal ulcer is that nausea and vomiting are much more common in appendicitis than

in perforated ulcer. Only 25 per cent of the perforated ulcer cases have vomiting after the onset of perforation. It is important also to remember in cases of perforated ulcer that the cases have, as a rule, three phases: first, symptoms dependent on the leaking of foreign material into the peritoneal cavity; second, after two hours there is the stage of temporary recovery; and, third, this is followed in 8 to 12 hours by peritonitis.

*Inflammation of a Meckel's diverticulum* is practically always diagnosed as an acute inflammation of an appendix which is lying along the terminal ileum or pointing across the lower mid-abdomen. An error in diagnosis in this case is not at all serious, but it should be kept in mind that if the abdomen is opened on the diagnosis of acute appendicitis and the acutely inflamed appendix is not found, and particularly if a small amount of free fluid is present in the abdomen, the abdomen should not be closed until at least two conditions have been excluded—Meckel's diverticulum, and acute small bowel obstruction involving the terminal ileum.

## THE FUTURE OF MATERNAL WELFARE\*

BY GRANT FLEMING, M.D.,

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THE modern public health movement, which is applied preventive medicine on a community basis, developed in England during the latter part of the past century. This movement had for its objective an increase in human happiness through the prevention of disease and the promotion of health. The present generation has approached nearer to the objective and enjoys a greater measure of health than has any previous generation. This achievement is not the result of chance. It has come about through the application of an ever-increasing body of scientific knowledge concerning the nature of disease and health. Progress has not been evenly distributed, for the reason that knowledge is not evenly spread over the whole field of medical science. We

know how to control typhoid fever, smallpox and diphtheria, but influenza, measles and infantile paralysis still remain our masters.

While we may bewail our inability to deal with certain problems of disease and health, we must not forget that there is a wide gap between existing knowledge and present-day practice. Just as long as deaths continue to occur from causes which are definitely preventable—as they do from diphtheria, for example—we should think of our failure to make use of what facilities we have rather than spend time in vain regrets concerning our ignorance in other directions. A problem of disease-prevention should first be approached through an endeavour to gain an understanding of the problem, based upon facts, not impressions. The second step to be taken is a consideration of the causes, direct and indirect, in their relative importance. Then we should enquire as to what knowledge is available whereby we

\* Based on an address given in Toronto, May 9, 1932, under the auspices of the Joint Committee on Maternal Care of The Local Council of Women and The Child Welfare Council of Toronto.

would be enabled to deal successfully with these causative factors. Finally, to whatever extent knowledge is available to make action possible, a program is required, so that this knowledge may be applied to the solution of the problem.

We are all aware that, at the present time, maternity is not as safe as it should be, and that we have not achieved the objective of full-term healthy babies, born with a minimum disturbance of the maternal organism. We know that we have not done so, because from our vital statistics we learn that, year after year, a number of Canadian women—over 1,200 in 1931—lose their lives on account of conditions arising out of maternity. We speak, first of all, of maternal mortality because we have a fairly accurate record of maternal deaths. Maternal mortality is not only a record of deaths, but is, at the same time, an index to the other serious problems associated with maternity. For every woman who dies, there is a much larger number who, although they survive the conditions responsible for mortality, go on into life more or less seriously disabled. In proportion to the seriousness of their disability, their capacity to enjoy life is diminished.

The death or serious disablement of the mother has grave social implications. The records of any social agency, particularly of those agencies which have to do with juvenile delinquency, show very often that a broken home lies at the root of the delinquency or other social problem. A mother's care means more to a young child than does anything else in the world. Individual and national efficiency are dependent upon healthy mothers. The deaths of the mothers result in a much higher mortality rate among the infants who survive them. The disablement of the mother may mean that she is unable to give proper care to her baby, and if she is unable to nurse her baby it is indeed a serious matter for the child.

While of recent years there has been a decreasing mortality from preventable causes, there has not been any corresponding reduction in maternal mortality; the rate remains at approximately the same level. In Toronto, the rate mounted for a few years, and then decreased, until last year it was down to the same level as in 1923. In Canada as a whole the rate is fairly constant. Along with this static

condition of the maternal death rate, we should also note that while infant mortality has definitely decreased, the number of deaths of infants during their first month of life has not been proportionately reduced. In Canada, in the year 1929, out of the total number of 21,674 infant deaths, 10,430 (48 per cent) were those of infants less than one month old. The explanation given for this is that the conditions responsible for maternal mortality and infant mortality during the first month of life are very often the same. The problems of maternal and neo-natal mortality are, in practice, so closely related that the rates will rise or fall together.

From what has been said, it is evident that maternal mortality is an index to maternal disabilities, grave social problems, the welfare of surviving children, and neo-natal mortality.

From the observed facts, we must conclude that the existing programs for public health and medical services are unable to bring about any further reduction in maternal mortality. Judging by results, the present efforts prevent any increase, but they are incapable of procuring a substantial decrease. In some ways, New Zealand has accomplished great things in public health. An infant mortality rate of 34, as compared with the Canadian rate of 85, is certainly a great achievement. But even in that country, the maternal mortality rate is relatively high (5.08 maternal deaths per thousand living births in 1930) and is not decreasing. In the New Zealand report for 1930, it is stated: "Thus, 512 of a total of 644 infant deaths in the first month of life occurred during the first week, and may be regarded as mainly due to pre-natal influences. It is also of interest to record that well over half of the infant deaths (in the first twelve months of life) occurred in this first week—that is, 512 in a total of 924." This is mentioned to show that even in New Zealand, they have not succeeded in reducing maternal and neo-natal mortality during recent years.

The Preliminary Report, Vital Statistics of Canada, for 1931, shows that out of a total of 1,210 maternal deaths, sepsis was responsible for 310; albuminuria, eclampsia and other toxæmias for 286; hæmorrhage, 137; abortions, 214. The Departmental Committee of the Ministry of Health for England and Wales on Maternal Mortality and Morbidity report (1932) in their study of 4,655 deaths due to

childbearing that the causes were: sepsis, 37.1 per cent; eclampsia and other toxæmias, 17.6 per cent; hæmorrhage, 14.3 per cent; abortion, 12.4 per cent. Percentages vary somewhat from year to year and from place to place, but not sufficiently to interfere with our understanding of the relative importance of the direct causes of maternal deaths.

However, this is not enough information regarding causes to enable us to plan a maternal welfare program. It is necessary to probe much more deeply in order that we may learn what are the underlying factors which allow these conditions to develop. We might profit in this respect by observing what has occurred in the field of public health, as regards tuberculosis, for example. Tuberculosis is caused by a germ known as the tubercle bacillus. The disease cannot occur unless this germ—the specific and direct cause of the disease—is present. The program for the control of tuberculosis is not, however, limited to attempts to destroy the tubercle bacillus. It is recognized that there are underlying factors, largely social and economic, which either favour or inhibit the spread and the activities of the germ. The program for the prevention of tuberculosis is planned chiefly so as to secure the establishment of that state of physical well-being, based upon health practices and good economic and social conditions, which makes it difficult if not impossible for the tubercle bacillus to cause disease in the human body. The success of the tuberculosis program is the proof of its soundness.

In the field of maternal mortality, there are, likewise, underlying factors which are the indirect causes of the problems. They are not recorded as such, and so data regarding them are not available as statistical information. We do, however, know something about them. We know that there are women for whom childbearing cannot be made safe. These women, on account of abnormal physical conditions, should not undertake pregnancy. Poverty is not an element, but a complex phenomenon which leads to malnutrition, overcrowding and insanitary living conditions. Poverty frequently forces the mother into some gainful occupation outside the home. All these conditions, together with attendant worries arising out of a poor economic status, frequently unfit the mother for maternity.

These are some of the indirect causes which give rise to the problem. There is an urgent need for us to learn much more concerning these indirect biological, social and economic causes. We require to study them with regard to their relative importance as causal factors. We should know, for example, the extent to which interrupted pregnancies and premature labour contribute to maternal mortality. This in turn would obviously lead to an enquiry into the reasons for the interrupted pregnancies and premature labour. The need for study is urgent, for, at the present time, we do not know very much about these indirect causes, and we must be familiar with them if we are to develop a better program in the future.

It was from this point of view that the British Committee approached their study. In their report, they state: "The Committee did not focus their attention primarily on the immediate cause of death . . . What they set themselves to discover, if possible, was the underlying causes which set up the train of events to which death was ultimately due . . . in many cases a definite defect in a reasonable standard of maternal care was clearly the starting point in the downward progress of the case." The Committee termed this defect "The Primary Avoidable Factor," the factors falling into four groups: lack of, or inadequate pre-natal care; lack of skill in the management of the case; lack of cooperation on the part of the patient and her family; lack of facilities for proper treatment.

It has long been accepted that every mother requires pre-natal, intra-natal and post-natal care. We may well view pre-natal care as preventive obstetrics, and post-natal care as preventive gynæcology. There is much evidence to show that when such care is given adequately, a definite reduction in maternal mortality is brought about. This naturally brings us to consider what is adequate care. Adequate care is regular periodic medical and nursing supervision throughout pregnancy; medical and nursing care at confinement; hospital facilities; medical and nursing care during the post-natal period. Together with medical and nursing care must go the services of social agencies when these are required. Care needs to be provided on a much broader and more inclusive basis than is usually the case. The best medical and nursing care will not meet the needs

of a hungry mother. A poor mother with a family of children, who is being confined at home, cannot secure the physical and mental rest she requires unless someone comes into the home and takes over her ordinary household duties.

The present program has failed, not because of lack of knowledge, but because, for one reason or another, it has not been applied to a sufficiently large percentage of mothers. A negligible number receive adequate pre-natal care. True it is that there is much more to be learned about the problem, but at present we have a sufficient body of knowledge to enable us to plan for the future a program which will be more effective. In our planning, we can learn much from past failures and successes. I believe that physicians can greatly profit by the experience of the Victorian Order of Nurses. The Order, as a visiting-nurse organization, provides a nursing maternity service. The cases are unselected, but the majority come from the lower economic groups where higher death rates are to be expected. Only cases which are under medical care are accepted by the Order. The nurses are graduate nurses—a point worthy of note—and if there are social needs in the home, the visiting nurse will secure the aid required through any or all of the social resources of the community. During the course of the year, the nurses of the Order attend at 6 per cent of all the births occurring in the Dominion of Canada. The maternal mortality rate for the group attended by the Victorian Order nurses is but one-third of what it is for Canada as a whole. If the same rate had prevailed for all cases, it would have meant the saving of the lives of more than 800 mothers in 1931. Do we not learn from the experience of the Victorian Order of Nurses what reasonably adequate medical and nursing care mean?

The British Committee were able "to draw the broad conclusion that at least one-half of the maternal deaths occurring in this country (England and Wales) were preventable," and "that the practice of attendance at confinement by a doctor accompanied by an untrained 'handywoman' does not afford a reasonable degree of security from septic infection even in normal cases, much less when an operative procedure has been undertaken." The experience of hospitals with maternity services sup-

ports this statement, and confirms the opinion that adequate medical, nursing and social services can solve most of the problems arising out of maternity.

Before we pass to a consideration of the future program, there are a few comments to be made. The problem before us is a complex one, with which many individuals and groups are concerned, and yet it is fundamentally a medical one. It is, above all, the problem of the general practitioner. Nursing and social services are necessary, but they are necessary, I believe, to round out the medical care which is the foundation upon which the other services should build. Pre-natal care which does not include a complete physical and obstetrical examination by a physician, together with regular medical supervision, cannot detect abnormal structural and functional conditions. Most serious conditions develop slowly, hence the need for regular medical supervision to discover abnormal functional conditions early, to prescribe treatment at a time when it will usually correct the condition and so prevent later serious developments. The second point to note is that while we may speak of pre-, intra- and post-natal care, we have to deal with a continuous process and one which should be considered accordingly. One physician, or at least one organization, should be responsible for the complete care required. The patient's own feelings would seem to demand this consideration.

Pre-natal clinics are not comparable with health clinics, nor should they, in my opinion, be organized on that basis. Well-baby clinics are, as the name implies, for well babies. Their purpose is to keep the baby well. The pre-natal clinic is for expectant mothers who will go on to confinement and into a post-natal period requiring active medical care. The pre-natal clinic without a confinement service is like a surgical ward without an operating-room.

The maternity problem, as it presents itself to us, is the result of certain direct causes with which we are familiar, and other indirect causes about which we know something. It is a continuous process with which we have to deal, even though we may speak of it as divided. That is why care should be given throughout by one physician or one organization responsible for seeing that adequate medical, nursing and social services are pro-

vided. A program based upon such a proposition would develop along the following lines.

The failure of women to secure care may be attributed to two main causes—ignorance and lack of facilities. There is need for a continuous program of public education with regard to the problem and the necessity for adequate care. The responsibility for popular health instruction rests with the Department of Public Health. It is not so much what the Department itself will do, although it can accomplish a great deal through its public health nursing staff, but rather what work it can direct. The educational work should be planned to reach the men as well as the women. Our experience indicates that we may hope for much more favourable action if we establish contact with the fathers. Every club and organization should be given a part in the program, and individual members brought to feel a sense of personal responsibility. I believe a great deal could be done by securing the active help of the clergy. The program requires central planning and direction; the logical centre for this is the Department of Public Health.

The second point—indeed it might be placed first in the future program—is a continuous study of the problem. A real difficulty in arousing the interest of the individual medical practitioner in this subject is due to the fact that he does not see maternal mortality as a serious matter in his own practice. If the maternal deaths are fairly evenly distributed, it means that each practitioner has to record about one maternal death every ten years. Therefore, it appears to be necessary to have the medical practitioners, as a group, study the problem. By so doing, they will come to see the situation as it exists. The individual practitioner will be informed about all the deaths which occur, instead of merely regarding the few in his own practice.

The study should be the responsibility of the local medical association, using the resources of the Department of Public Health for statistical and other purposes. It should delve into the subject so as to bring to light the underlying factors about which we are comparatively ignorant. The study will furnish the facts upon which future plans will be based.

There is another study which should be made. We are aware that some countries have a lower maternal death rate than we have in

Canada, but we do not know the reason for this. We may jump to the conclusion that it is because there are trained midwives in these countries, but we do not possess enough information to enable us to say that the trained midwives provide the explanation in whole or in part. It does seem that the time has arrived for a clinical study of conditions in these countries. If it were possible to secure an obstetrician of wide experience, who is free from established personal opinions as to the explanation for these lower death rates, he could add considerably to our fund of knowledge by visiting these countries and studying the subject clinically, not statistically. He should be accompanied by a public health physician who would consider the related public health and social aspects of the subject.

If it is agreed that medical service is the foundation upon which we are to build, it is naturally of the utmost importance to consider how such service is to be made available. Under our present urban organization, medical service of all types is available through private practitioners and hospitals. The responsibility for the care of the indigent sick has, in general, been accepted by the hospitals through their in- and out-patient departments, the hospital receiving some allowance for indigents from the Province and the City. When we come to consider a maternity medical service, we must, I think, view that service as a part of all medical services and not as something separate and distinct. Any plan for maternity medical services must be part of the whole plan for medical services in the community.

I do not intend to deal with the present system of medical practice, or enter into a discussion of its strength or its weakness, or suggest possible plans for changes. That, I take it, is another subject. Suffice it to say that my personal opinion is that service should be paid for, and that governmental responsibility should not be met at the expense of the medical profession. Our plan for maternal welfare must be based upon conditions as they exist. Under present conditions, there rests upon the hospital a moral obligation to make available a complete maternity service which shall be adequate for the needs of that part of the population which is dependent upon the hospitals. The hospitals should provide pre-natal clinics, outside of the hospitals, within reasonable access of all parts of

the city. The hospitals should provide a confinement service both in and out of hospital, post-natal care being, of course, included. The decision as to whether or not confinement is to be at home or in hospital would be determined by the condition of the mother and the home rather than by the woman's personal choice. Hospital beds should be kept for those requiring hospital care. To sum the situation up, the responsibility for the provision of medical service would be placed with the organization now existing.

I do not think we need fear that there will be abuse of hospital service, as those who are able to pay for service will prefer their own private physician, but some economic standards should be available as a safeguard. For those who are able to pay, service should be given by the private practitioner, and he should provide a service comparable to that furnished by the hospital. The private practitioner should refer to hospital such cases as require hospital care. The British report states: "Reduction in the group of deaths following abnormal labour will be effected only when general practitioners realize that the surroundings of the ordinary working-class home are not suitable for the performance—often without adequate help—of difficult obstetric operations. . . ."

In providing pre-natal care, much of the supervision and most of the instruction can be given as well, and often better, by a nurse under the direction of a physician, rather than by the physician alone. At confinement, nursing service is essential. Further, the nurse will likely be more familiar with the social resources of the community, and so it is she who is the logical one to call upon such resources when there is need to do so.

The provision of nursing service for hospital cases, whether confined in or out of hospital, would be the responsibility of the hospital. The hospital would meet this responsibility for nursing service in the home through arrangement made with the visiting-nurse organizations.

Nursing service in the home is available in many places for cases under the care of private practitioners either through private-duty nurses, or through the Victorian Order of Nurses or

other nursing organizations. Provided that private practitioners would use the visiting-nurse services, the social problems in the home would be much more easily dealt with.

The proposed program may be briefly summarized as public education directed by the Department of Public Health; continuing study of maternity problems by the local medical association; clinical study of maternity in other countries; medical services through private practitioners and hospitals; nursing service through private-duty nurses or visiting-nurse organizations; social services through social agencies.

It is obvious that service costs money, and that if mothers' lives are to be saved, disabilities prevented, social problems avoided, and infant lives preserved, more money will be needed to support the organizations that are required to carry out the program. Visiting-nurse organizations will require such support as will enable them to serve all who are unable to pay, or who are able to pay only in part for their nursing care. The social resources of the community must be developed to meet the needs of all cases. Visiting housekeepers must also be available to assume the mother's place in the home. In some cases, food and shelter will have to be provided by some family agency.

The general health work of the community benefits the mother as well as all other citizens. Nutrition work which provides for the proper feeding of female children will prevent rickets, and, in consequence, the deformed pelvis which leads to trouble at the time of confinement. There are certain problems which are peculiar to maternity, and it is important that a sound plan be developed for dealing with them. That is why it is stressed that there is need for study in order that the entire situation may be better understood, and also that, as the problem is fundamentally one of medical care, it should, in the future, be dealt with through the co-operation of private practitioners and the hospitals. If the work be undertaken on a sufficiently broad basis, there seems to be no reason why maternal deaths should not be brought down close to the vanishing point.

## SPINAL ANÆSTHESIA IN CÆSAREAN SECTION\*

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THE choice of anæsthetic in Cæsarean section has long been recognized as one of prime importance, chiefly, perhaps, because there are two lives to safeguard instead of one. A balance must be struck between the anæsthetic dictated by the general condition of the mother and that suited to the needs of the fetal respiratory system. Each new anæsthetic has early been put on trial in this grave surgical emergency, and it is little wonder that with the re-introduction on a safe basis of spinal anæsthesia this method has by now been thoroughly tested.

In the past year and a half, one-third of the Cæsarean operations at St. Michael's Hospital were done under spinal anæsthesia, and because this proportion is increasing, it was thought that an analysis of the work might be of interest. The data here given cover the years 1931 and 1932 to September, and apply to all cases handled by the members of the staffs in obstetrics and anæsthesia. Thus it is a composite picture which is presented, and while the conclusions are, to a certain extent, personal, they are based on a remarkably even distribution of work among both surgeons and anæsthetists.

The number of cases is, of course, small, comprising 63 operations during 1931 and 1932, plus 11 previous operations on these same patients in earlier years. These were included in an attempt to compare different types of anæsthetic in the same patient. The comparison yielded no particular information except in one woman who developed a severe broncho-pneumonia following ether in 1929 and showed a normal recovery after spinal anæsthesia in 1932. In all, 9 patients had two operations each and two had three each. These repeat operations are one great reason for careful choice of the anæsthetic. Few operations hold such certainty of future repetition as Cæsarean section, provided, of course, that no steps have been taken toward contraception. It therefore behooves the anæsthetist to leave behind a good impres-

sion, by choosing his agent with a thought for the mental reaction of the patient. To illustrate. In our 62 individual patients, the cause of operation was given 18 times as "previous Cæsarean". Thus the dictum, "Once a Cæsarean, always a Cæsarean," plays its part, if not as literally as it once did, yet still to a great extent. It is an ever-widening circle, and if some diseases may be called "self-limiting," surely Cæsarean section should be termed "self-extending." For the anæsthetist the point is to protect the patient's mental outlook on surgery, by as comfortable a procedure as possible.

In correctly evaluating any form of anæsthesia, consideration must be given to both mother and child. Both will, of course, be influenced by the pre-operative condition of the mother and the immediate cause of operation. Undoubtedly the simplest and safest procedure is in the healthy woman with a contracted pelvis, operated on at term, as early in labour as possible. Of our 74 cases, 49 or 66 per cent were in this category; 13 or 18 per cent had contracted pelvis plus such conditions as diabetes, prolonged or premature labour, advanced eclampsia, pyelitis, epilepsy, etc.; and 12 or 16 per cent had normal pelvis but showed pre-operative complications similar to those mentioned. Comparing the two groups, adding together all with abnormal health, irrespective of pelvic measurements, we find that, in the mothers, post-operative complications were about equal *numerically*, being 11 per cent in the simple contracted pelvis group as against 16 per cent in the other; but the *nature* of the post-operative complications was definitely more severe in the abnormal group. The difference was even more striking in the babies. In the healthy contracted pelvis group, 16 per cent of the babies showed complications, including 2 deaths, whereas in the other series, 26 per cent showed complications, including 5 deaths. Were these complications due to, or accentuated by, the anæsthetic used? Could they have been avoided by the choice of a different anæsthetic? Not always of course, yet the answer to both

\* Read before the combined meeting of the Section of Obstetrics and Gynæcology, with the Section of Anæsthesia, November 2, 1932.

is, to some extent, in the affirmative. Careful analysis of the figures confirms the personal belief that the use of ether, even in small amounts, is undesirable, particularly for the baby. The choice lies between nitrous oxide-oxygen alone and spinal anæsthesia. This does not mean that ether is always bad, or that spinal anæsthesia or gas is always good; far from it. Difficulties occur with both, but the association of complications, either in mother or child, with the use of ether is too striking and too constant to be brushed aside as mere coincidence.

The anæsthetic most frequently used here was nitrous oxide-oxygen, either by itself or with ether. Alone, the results were excellent. It was thus given 7 times to normal and twice to abnormal cases. One mother died of shock which had its onset shortly before leaving the table. While the cause could not be positively determined, there was no definite incrimination of the anæsthetic. All others did well, including two early eclamptics. The babies all did well; breathing started with no particular difficulty and they made normal progress in the nursery. Thus nitrous oxide gave very satisfactory results; but how often is a gas anæsthetic strictly nitrous oxide and oxygen? Another 24 cases were *started* with nitrous oxide but in the end had to have ether as well. That is, in 36 cases (half the series) nitrous oxide was the anæsthetic of choice, but in only one-quarter of the group was it satisfactory to the surgeon, and enough ether had to be added to remove it from the group of gas anæsthetics. Was this to the disadvantage of the mother or child? Fifteen normal mothers were included in this nitrous oxide-ether group. One developed acute bronchitis the next day with a fairly severe convalescence. Another showed considerable shock during the operation but had a normal recovery; her baby, however, did not breathe properly and died in half an hour. Ether here cannot be entirely freed of blame. Two other babies of this group also required considerable resuscitation, but later made normal progress. Of the 9 abnormal mothers, one developed a severe broncho-pneumonia immediately, but she undoubtedly had the infection on admission. Others made uneventful recoveries despite the presence of diabetes, chronic sinusitis and epilepsy. The babies, unfortunately, did not escape as well. Two were

resuscitated with great difficulty but eventually were all right. Two premature infants died of atelectasis in 14 and 17 hours respectively, and one twin died of the same cause in 8 hours. One baby, of the diabetic mother, did well for 5 days and then developed a fatal pneumonia. It would appear that these babies were under a great handicap due to existing pre-natal ill health in the mother, and that some of them, at least, found the addition of the circulating anæsthetic too great a depressant. Consideration of the cases under straight ether tends to confirm this. It was used only six times in the last two years and then only in apparently "safe" cases. One baby died in 20 hours of atelectasis and another was resuscitated with great difficulty and caused some concern for several days. Of the mothers, one, mentioned at the start, developed severe broncho-pneumonia in 48 hours. Another showed shock during the operation and died on the second day of ileus. If ether is a factor in all this, then spinal anæsthesia should show a comparatively good picture. In our 21 cases it undoubtedly did. In the normal mothers, one case of pyelitis was the only complication. In the abnormal series, the only untoward result was in a case of ruptured uterus—ruptured through an old Cæsarean scar before the onset of labour and admitted as a surgical emergency. The gravity of her case from the start rendered any effort merely a desperate attempt to obtain a living baby—in this, they were entirely successful. The complications safely withstood included advanced eclampsia, placenta prævia, fibroids, attempted forceps delivery and accidental hæmorrhage. The favourable balance in the babies was even more striking, with only one poor result; one premature infant was resuscitated with difficulty and died of atelectasis in 8 hours—the mother was suffering from severe accidental hæmorrhage but did well herself. The only other complication was some delay in breathing, seen in two patients, both of whom responded completely in three minutes—and this despite the fact that morphine had been used in both instances. In two other babies, breathing was spontaneous, before the body was out of the uterus, in spite of morphine, a drug which had proved undesirable when combined with ether. This statement is based on the fact that three of the atelectatic deaths already mentioned followed the use of

morphine and ether, and in the only other case in which the combination was used resuscitation was very difficult. That is an important point with any anæsthetic for the preliminary sedative undoubtedly puts an additional strain on the fetal respiratory apparatus, and it is quite significant that the only two cases in which morphine was not followed by prolonged or fatal interference with alveolar expansion were those under spinal anæsthesia. Local anæsthesia was used in 3 cases. Two were entirely successful, but the third died on the seventh day of advanced eclampsia, after being delivered of a macerated fetus; without doubt it was too far advanced to be influenced by the anæsthetic. From the standpoint of comfort of the patient, local anæsthesia is open to question, but it would seem to provide a safe method of avoiding inhalation anæsthesia where the spinal method is deemed undesirable. In 7 cases the records were incomplete but events were apparently uncomplicated. Thus the evidence leans strongly to spinal anæsthesia or to nitrous oxide-oxygen alone,—a combination which is almost as difficult to handle here as in other abdominal work, and which may in the end demand the addition of ether, sufficient to turn the tables, if not for the mother, then for the child. The redeeming feature is that many times nitrous oxide alone will suffice until after delivery of the baby, and the disadvantage of ether for closure will thus be confined to the mother, and our figures seem to show that it is the baby, much more than the mother, who is susceptible to ether or morphine.

As regards the technique of spinal anæsthesia, it does not differ from that in any high abdominal operation and presents no particular difficulty, despite the size of the patient. There is more trouble in arching the back, but intervals between pains usually permit the puncture. In eclampsia, convulsions may interfere, or, as in one of our cases, œdema may be so great as to obscure the usual landmarks and make the puncture a blind process. The drug used in all cases was neocaine. Aside from some nausea and fall in blood pressure, such as it gives in most extensive abdominal procedures, it was entirely satisfactory. Nupercaine appears to cause the patient less distress, with less nausea or fall in blood pressure, but it would be difficult to turn her on her face for five minutes following the injection, and

this is absolutely necessary for complete anæsthesia. Further, the much longer duration of the nupercaine effect—up to 2 hours or more—is not required here, since the operation seldom takes more than an hour (many of ours took only 25 to 40 minutes from incision to dressing. Similarly, pantocaine, which we have used with excellent results in low operations, is entirely unsuitable, due to the impossibility of getting anæsthesia of sufficient height. Its main advantages (prolonged effect, up to 3 and 4 hours, and very slight changes in blood pressure) are nullified here by inability to get anæsthesia much above the umbilicus. The dose of neocaine has been from 100 to 200 mgrm. Lately, 120 or 150 have been found ideal. Injection has usually been between the 3rd and 4th lumbar vertebra—occasionally between the 4th and 5th or 2nd and 3rd. The 2nd and 3rd space is not advised unless puncture at the lower site is impossible. With neocaine we have had no difficulty in getting just as high anæsthesia in one space as the other, and there would seem to be less danger of damage to the cord. The amount of spinal fluid used varied from 1.5 to 4 c.c., the usual amount being 3 c.c. and this, re-injected with moderate barbitage, has always given ample height—usually to the nipple line. In most cases we used one grain of ephedrine (occasionally a half grain) fifteen minutes before the puncture. With the higher blood pressures of eclampsia, the smaller dose may be advisable, but here the fall is greater than with the normal patient, and we have not found the whole grain too much. It seldom needs to be repeated, since pituitrin (or ergot) serves much the same purpose and is used immediately following delivery of the baby, which is about the time of greatest fall in pressure. As regards hæmorrhage, it is no greater, and probably less, than with other anæsthetics. There seems to be a fear that spinal anæsthesia will cause a relaxation of the uterus and so prevent hæmostasis; such is not the case. There are repeated references in the literature to very little change in force or frequency of contractions under spinal anæsthesia, both in Cæsarean and normal delivery. We had two interesting observations, differing from anything we have seen reported. Both women had rhythmic contractions with *labour pains*, although all other anæsthesia was perfect. In both cases, there was violent contraction fol-

lowing pituitrin and commencing about the time the uterus had been sutured and replaced in the abdomen. There was no difficulty in completing the operation; relaxation of the abdominal muscles was perfect and all the sutures were inserted with absolutely no pain, yet with each regular contraction she complained of again being in labour. One patient was followed for 20 minutes after the end of operation before the usual return of sensation occurred, and in the interval she complained of this severe uterine pain, while sharp pin-pricks at the nipple line aroused no comment. The other case was similar but less definite, as complete sensation returned shortly after the onset of the contraction pain. It is of course an unusual occurrence, but it is reassuring to know that contractions are to be expected and hæmorrhage prevented.

The results in this limited series were so satisfactory that an investigation into the experiences of others was determined upon. In an endeavour to obtain a true cross-section of opinion, we extended our search beyond the reports of the strictly surgical writer or the anæsthetic worker, whose conclusions may, unconsciously, be biased, and examined all articles dealing with Cæsarean section published during 1930 and 1931 in seven of the leading British, Canadian and American journals. Reports

were not as extensive as expected, and were marked by a striking absence of anæsthetic data. Series after series, often dealing with hundreds of cases, contained no mention of the anæsthetic. In all, over 1,300 Cæsarean operations were reported on without comment as to anæsthesia. Against this were 617 under spinal and 134 under local anæsthesia, with little mention of nitrous oxide or ether—apparently these were the agents used in the unidentified group and deemed unworthy of mention, as compared to the more spectacular spinal or local technique. Comments on spinal anæsthesia were universally good, and, while reports were scanty, no adverse opinion was expressed. Repeated reference was made to the point already mentioned that contractions are not interfered with. When definite comparisons were made, the consensus was strongly in favour of spinal anæsthesia—or if a general anæsthetic was demanded, nitrous oxide, preferably without ether and without any strong pre-medication.

We have attempted to analyze our own cases with an open mind, and it is naturally gratifying to find that the opinions of the writers reporting definite data coincide quite closely with ours. We feel justified, therefore, in presenting these findings, although based on a group of cases too small to be of much significance by themselves.

## CANCER OF THE LARGE BOWEL\*

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### IX

**T**WENTY years' experience in x-ray work, in which the diagnosis and treatment of gastro-intestinal conditions forms a special feature, has led the writer to arrive at some very definite conclusions. Among these conclusions none are more emphatic than that cancer of the colon is rapidly increasing, and that cancer has reached a very advanced stage before the radiologist is given an opportunity to make his investigation. There is perhaps no other portion of the body where malignancy is

of such insidious onset. While cancer of the colon is, like all other cancers, at first a local disease, and capable of eradication, there are, at this early stage, absolutely no symptoms or physical signs which are pathognomonic of the condition. When it has reached the stage where symptoms and physical signs become diagnostic, the period for effective treatment has most frequently gone by.

Because of these facts the writer wishes to emphasize to the general practitioner, and, through him, to the public, the great danger of allowing seemingly trivial symptoms from the gastro-intestinal tract to go without thorough investigation, especially if such symp-

\* Previous papers in this series can be found in the *Journal*, as follows: 1932, 27: 521, 612; 1933, 28: 30, 182, 246, 392, 521 and 602.

toms are not readily responding to treatment. The persistence despite treatment of such disturbances as gas on the stomach or bowels, vague indigestion, loss of weight and strength, and constipation, should call for prompt and efficient investigation by an expert radiologist. The adjective "expert" is used advisedly, because no one who is not investigating gastrointestinal conditions from day to day, and thus securing familiarity with the early signs of cancer, can possibly recognize those small departures from the normal which indicate early malignancy. Further, one examination, if it proves to be negative, must not be regarded as conclusive. Repeated check-up must be made at regular intervals.

Without going into the voluminous literature bearing on the investigation of early cancer the writer would seek to impress the above view-point by the citation of observations made in his own experience. For this purpose an analysis has been made of 60 consecutive cases of cancer of the colon which have come under observation in the Bigelow Clinic. From this analysis will be established: (1) that there is no early clinical picture which points definitely to cancer of the colon; (2) the early symptoms the persistence of which, despite treatment, calls for searching investigation as to the possibility of malignancy; and (3) the possibilities of cure or palliation of cancer of the colon in the advanced stage, at which it usually presents itself for treatment.

#### INCIDENCE

The incidence of cancer of the colon, as compared with malignancy elsewhere in the body, is indicated by a study of recent cases. Two hundred cases of cancer have been reported by this clinic in the past three years. Of this number 40 were of basal cell type (rodent ulcer), 12 were sarcoma, while 148 were squamous cell carcinoma. Of these 148 cases 10, or 7 per cent, were in the large bowel. Comparing this frequency of occurrence of malignancy in the large bowel with that occurring in other parts of the body, we find that, while 10 cases of cancer of the colon were being treated at the clinic during this 3 year period, this number was exceeded only by epithelioma of the lip, 18 cases; cancer of the breast, 15; cancer of the bladder, 16; and cancer of the stomach, 12.

Classification, according to sex, of the 60 cases analyzed in this series, shows that 34 occurred in men and 26 in women.

Classification according to the portion of the colon involved, shows 10 in the cæcum and ascending colon, 6 in the transverse colon, 5 in the descending colon, and 39 in the sigmoid and rectum. Two-thirds of all cancers of the colon occur in the sigmoid (rectal region). This fact should facilitate early diagnosis, for, as we shall see, cancer in the rectum or sigmoid gives a greater preponderance of symptoms than that occurring elsewhere in the large bowel. Further, there are, in this location, two methods of examination which are not available in other parts of the colonic tract. Every practitioner should make himself proficient in them. They are, the exploration of the rectum by the examining finger, and the visualization of the rectum and sigmoid by means of the proctoscope or the sigmoidoscope.

#### SYMPTOMATOLOGY

The cæcum and the ascending colon give the fewest symptoms in the presence of malignancy, while the descending colon, sigmoid and rectum yield the largest number, the transverse colon being the intermediary. In the 60 cases of this series, the cæcum and ascending colon gave an average of 2.3 symptoms per case, the transverse colon, 3, and the descending colon, sigmoid and rectum, 3.5. Classification of the symptoms from the standpoint of the time of their occurrence may be made into "early" and "late". The early symptoms, common to all parts of the large bowel, were vague indigestion, anorexia, gas in the stomach or bowels, weakness, tired feeling, constipation and loss of weight; the late symptoms and signs were obstruction, partial or complete, a palpable mass, pain, vomiting and bloating. In cancer of the sigmoid and rectum, additional early symptoms were pruritus ani, frequency of urination, frequency of bowel movement, and alternating constipation and diarrhoea, while additional late signs were the flattened stool, mucus and blood in the stool, and loss of control of the bowel.

Considerable significance attaches to certain symptoms from a diagnostic standpoint. For instance, while pain is a late symptom, yet in several of the cases the onset of pain was antedated for months by an indefinite soreness in the region. While complaint of being weak

and tired is naturally considered a late symptom, yet we have placed it among suggestive early symptoms, since 6 patients have mentioned it as an early occurrence, while 8 did not mention it until the malignancy was well advanced. Weakness and the "tired feeling" is an evidence of toxæmia, and malignancy should suggest itself as a possible cause. Loss of weight should usually be a late finding, but it was mentioned by 9 patients as an early disturbance, whereas 16 did not mention it until late on in their illness. Hence, unexplained loss of weight should suggest possibility of cancer as a cause. Constipation was an early complaint by 18 patients, and should therefore carry considerable weight in turning the thought toward malignancy. Mucus in the blood and stool was an early finding in 6 cases of cancer of the sigmoid or rectum, whereas it occurred late in eight cases. It should suggest cancer. Bowel frequency was mentioned by 7 patients early, while 8 did not speak of it until late in their illness.

A study of the relation of the time duration of symptoms to the severity of the cancer gives rise to some striking findings. The cases of this series which came to operation and were found resectable had an average duration of symptoms of ten months. The cases which came to operation and were found non-resectable, had an average duration of symptoms of five and a half months. These latter appeared to have been of a more acute fulminating type, and invaded glands and surrounding tissues rapidly, whereas the former ran a more chronic course, and showed a slower involvement of the glands and surrounding tissues.

Further, an attempt to find a standard for estimating the relative malignancy of cancer in various parts of the large bowel, on the basis of the relative duration of symptoms, is fruitless. The proportion of 24 resectable cancers to 30 non-resectable, discovered at operation, on 54 cases of this group, remains approximately the same throughout the various sections of the bowel. Thus, 4 cancers of the cæcum and ascending colon were resectable and 5 not; 1 of the transverse colon was resectable and 2 not; 19 of the descending colon, sigmoid or rectum were resectable and 23 not. Thus, there is no *a priori* criterion by which the severity of a cancer can be determined from the standpoint of duration of symptoms. The short

time-interval between the onset of symptoms and the inoperable cancer, five and a half months, is the strongest reason for early and thorough investigation of suspicious symptoms.

#### DIAGNOSIS

With such symptoms as enumerated above, whether all of the group or only a few, are present, what are the special diagnostic measures which must be employed? First, the rectum must be examined digitally. This is a diagnostic measure within the scope of every practitioner of medicine. Secondly, the rectum and sigmoid must be examined by a proctoscope or a sigmoidoscope. This, again, is a measure in which every general practitioner should become proficient. Thirdly, a blood count should be made. This again, is a diagnostic method which should be practised in every office. However, in the estimate of the probability of cancer of the colon, the blood count is apt to be misleading. The red count is not diminished as much as might be expected. The average red count of 17 women in the series studied, was 4,230,000, while the average of 28 men was 4,250,000.

The most important diagnostic measure is the x-ray. With such early symptoms as mentioned above, and their continuance despite treatment, no delay should occur in sending the patient to be examined by an expert radiologist. At the risk of repetition of what has already been stated, one cannot make the assertion too emphatic that the life of the patient may be dependent upon repeated examinations by a radiologist experienced in this work. This examination must consist of both the barium meal and the barium enema, and should be conducted both fluoroscopically and radiographically. As bearing upon the reliability of the x-ray in demonstrating cancer of the large bowel it should be said that, in this series, the x-ray revealed the malignancy in all the cases, with one exception. In this one case the radiologist knew that the sigmoidoscope had shown a carcinomatous growth of the lower sigmoid, yet the barium enema was neither retarded under the fluoroscope nor showed deformity on the x-ray film. The overwhelming percentage of correct diagnoses should be sufficient answer to those who decried the value of the x-ray in the diagnosis of cancer of the colon.

Three case histories will illustrate what has just been said of the value of the x-ray, and the necessity of early and repeated examinations.

#### CASE 1

In 1924 a patient was referred to the clinic. The history was: cramping pain across the lower abdomen of one month's duration, bilious spells, headache and vomiting, passage of blood and mucus from the bowels for years, but worse during the past month. The referring physician had made an examination and found a pelvic mass. He immediately referred the patient for x-ray examination. Clinically, the findings suggested a diagnosis of retroversion of uterus with impaction and resulting colitis, with adhesions of colon in left pelvis. The sigmoidoscope did not reveal any ulceration. The barium enema showed "marked distension and delay when the iliac colon was reached, with such severe cramps that the enema had to be stopped." On a subsequent day the enema had to be repeated, with similar pain, delay and dilatation of the rectum and lower sigmoid, but it slowly passed the obstruction, and the rest of the colon was filled. A film of the colon, made after the barium meal showed no evidence of ulceration, while a film of the barium enema showed dilated rectum and sigmoid. The x-ray diagnosis was "partially obstructing annular carcinoma of the sigmoid." Operation was advised, but the patient returned home. Six months later she presented herself for operation, and it was fortunately still possible to excise the carcinoma, and do an anastomosis. The patient is living, nine years later.

An example of the unbelievable obtuseness of some people regarding their own physical condition is that of a patient who presented herself with greatly enlarged abdomen, which she said dated back only two weeks. The abdomen was found to be distended with free fluid, which displaced the apex beat of the heart upward one and a half inches. Surgical exploration revealed inoperable malignant growth involving cæcum, ascending, descending and sigmoid colons.

The following case illustrates the necessity of a routine x-ray examination.

#### CASE 2

The patient was operated on in 1927, when a ruptured pelvic floor was repaired. Four months later she was treated for degenerative endometritis and cystitis. In February, 1930, this condition had cleared up, but the urine had a very foul odour. Colon bacilli were found in the urine and a vaccine made. Patient complained of occasional soreness over the symphysis pubis. In July, 1930, complaint was made of occasional faint spells. In January, 1931, bladder and urethral soreness had returned. There was pain in the left abdomen. The patient now stated that she had passed a little blood from the rectum some eight months previously.

On physical examination a freely movable mass was found in left abdomen. Barium enema showed a "freely movable tumour at the junction of the mid and left third of the transverse colon, deforming the colon outline, but not completely obstructing." Diagnosis was made of carcinoma of transverse colon. Operation was done and the carcinoma mass and adjacent glands were resected and an end-to-end anastomosis made. Subsequent x-ray therapy has continued to date and patient is apparently in good health, two years later.

One cannot but feel that there was some connection between the fainting spells, and the soreness above the symphysis pubis, and the bad urine odour, all complaints of a year's standing, and that a routine x-ray examination at an earlier date might have revealed the early cancer and greatly improved the ultimate prognosis.

#### TREATMENT

As already intimated, the argument for early diagnosis of cancer of the bowel receives its strongest corroboration when the problem of treatment must be faced. Analyzing the 60 cases of this series, 6 were not advised, or refused, operation. Of the remaining 54, the appalling number of 30, when explored surgically, were so far advanced, or so complicated by involvement of glands or surrounding tissues, that nothing surgical, apart from a colostomy or other type of drainage, could be done. The remaining 24 were resected, with either permanent colostomy drainage, or anastomosis, and, for the most part, were given x-ray treatment subsequently over a more or less extended period.

Analysis of the results in the 24 resected cases follows. Ten are living to-day, with an average duration of life of six years since operation. These all received x-ray treatment. Two cases died in the hospital following operation. Eleven cases died at various intervals following operation, the average duration of life being three years. Of these 11, three did not return for subsequent x-ray treatment, and their average life duration was two years, while the remaining 8 were treated by x-ray, and their average life-duration was three and a half years. One case has been untraced and is presumed to be dead.

Analysis of the results in the 30 cases explored surgically and found non-resectable, follows. Twenty-seven cases are known to be dead; 3 are untraced, and none are living. Four of the cases died following operation. Twelve received x-ray therapy over varying periods of time, and lived on an average eleven months. The condition of the remaining 14 was too grave to admit any further treatment after the exploratory operation.

#### ANALYSIS OF SIX CASES NOT OPERATED ON

Of the 6 cases where operation was not advised, or refused, 2 are living, 2 are dead, 1 is untraced, and 1 had improved when last heard

from. All were treated by x-ray, while one case of cancer of the rectum had radium in addition.

#### TOTAL RESULTS

Forty patients are known to be dead of the disease: 5 remain untraced; 13 are living, with an average duration of life of five years and eight months. In addition to the 13 patients living, 1 patient, treated by resection and x-ray, lived thirteen years following operation, and died of an empyema. Another was resected and treated by radium and x-ray, and died one year following operation as the result of an acute heart attack. Another patient lived more than five years following resection and x-ray treatment and died showing no definite evidence of recurrence of the disease. So that, resection, x-ray therapy, and radium therapy may fairly be credited with saving 15 cases of advanced cancer of the large bowel over a five year period. In other words, 25 per cent of the 60 cases were given at least a five year further lease on life.

#### SUMMARY

1. Cancer of the large bowel is of insidious onset, and there is no group of symptoms pathognomonic of its early stages.

2. Certain early symptoms are common to early cancer of the colon, and their persistence, despite treatment, calls for early, and, if neces-

sary, repeated investigation by a skilled radiologist.

3. Sixty of the writer's cases of cancer of the large bowel are analyzed.

4. The early symptoms were vague indigestion, anorexia, gas in the stomach or bowels, weakness, tired feeling, loss of weight, and constipation. Late symptoms were obstruction, partial or complete, palpable mass, pain, vomiting, and bloating.

5. Special diagnostic measures to be employed are, (a) examination of the rectum digitally and through the proctoscope; (b) examination of the sigmoid through the sigmoidoscope, and (c) x-ray.

6. Three illustrative case histories are cited.

7. Treatment consists of surgical resection, where possible, radium in certain cancers of the rectum, and x-ray in all cases.

8. Surgery, supplemented by x-ray, is the sheet anchor of therapy in cancer of the large bowel. In 24 cases of resection 10 patients are living six years afterwards; while in 30 non-resectable, all are dead, although x-ray therapy prolonged the life of twelve for a period of eleven months.

9. Combined therapy saved 15 lives (out of 60) over a five year period. This five year period will be much increased, since 13 of the 15 are living and apparently free from disease.

### OLEOTHORAX

(A STUDY OF 25 CASES AT THE MANITOBA SANATORIUM, NINETTE),

By E. L. ROSS, M.D.,

*Assistant Superintendent, Manitoba Sanatorium,*

*Ninette*

OIL had been used therapeutically in the pleural cavity previous to 1922, but it was then that Bernou began its use more extensively, and he was the first to apply to this procedure the term "oleothorax." At the Manitoba Sanatorium, oleothorax has been used in one form or another in 25 cases since October, 1931. The following observations are based mainly upon our experience with this series.

The indications for this treatment, as we see them, and as written about by others, are as follows:— (1) empyema, tuberculous, unmixed, non-toxic, and preferably of not too long duration; (2) pneumothorax, ineffective because of

pleural adhesions; (3) obliterative pneumothorax, in which the pleural space is gradually being lost, due to the creeping out and symphysis of the pleuræ; (4) a mobile mediastinum, when satisfactory collapse of the lung cannot be secured; (5) broncho-pleural fistula. This is a more doubtful indication, and some do not advise oil in such a case unless the fistula is very small. Matson considers as contraindications large pleuro-pulmonary fistulæ or ordinary sero-fibrinous exudates, and he thinks oleothorax should not replace a pneumothorax merely on account of the rapid absorption of air.

Gomenol (Niaouli oil) is a volatile, slightly yellow oil obtained from distillation of the leaves of a tree of the myrtle family found in the region of Gomen, New Caledonia. It has definite bactericidal properties, and inhibits the growth of micro-organisms, especially acid-fast bacilli, and, in less degree staphylococci. Tubercle bacilli have been killed in from five minutes to three hours, whereas staphylococci required from three to nine hours. Thus a higher concentration of gomenol is necessary for a mixed-infection empyema than for one definitely tuberculous.

The two oils commonly used as bases for the gomenol are liquid paraffin and olive oil. These we prepare by straining through twelve layers of gauze, and sterilizing in dry heat for twenty minutes at a pressure of twenty pounds, with a sterilizer tester submerged to insure sterilization. The oil is then re-filtered, never kept for more than two weeks, and never re-sterilized. At the time of use gomenol is then mixed with the basal oils according to the strength required. Some writers advise against using mixed oils until they have stood for two or three weeks and become thoroughly mixed.

Olive oil is more absorbable than paraffin, so is of greater use in overcoming pleural infection. When the desired action is mechanical only the mineral oil has been advised, with possibly only 1 per cent of gomenol. Most writers on the subject consider olive oil less irritating, but Goldenberg and Flanchuk definitely state the contrary. We began by using paraffin oil and gomenol, the latter usually in 5 per cent dilution, and found we were getting many reactions. During the past year we have used olive oil almost entirely, with gomenol, 2 to 5 per cent, in empyemata, and alone, or with only 1 per cent gomenol in ineffective or obliterating pneumothorax, and have had very few reactions. We now think, that in a pleural cavity not infected, only olive oil and no gomenol should be used. Paraffin oil in our experience is more irritating to the pleura than olive oil.

Serious reactions can usually be avoided if the sensitiveness of the pleura is tested. We begin by putting into the pleural cavity 2 to 5 c.c. of the oil mixture with the regular pneumothorax refill. If this causes no reaction in from four to seven days, we put in 10 c.c., and if there is still no reaction the amount is gradually

increased until about 200 c.c. are given at once. If an exudate forms, fluid is aspirated and the oil withheld until all tendency to fluid formation has ceased, then begun again carefully. It is not wise to convert a pneumothorax into an oleothorax too rapidly. However, if the pleura has been rendered less sensitive or insensitive by a long-standing effusion, especially if purulent, the precautions here indicated usually do not have to be taken. In fact we have had our best results with empyemata when the actual amount of pus aspirated has been replaced at once by 200 to 300 c.c. of oil. A greater surface of exuding pleura is thus in contact with the oil.

Special technique, special needles, etc., have been described by many, the main object being to control the intra-pleural pressure. We have found that warming the oil to body temperature, and using an 18 gauge needle and 20 c.c. syringe works well. After each 20 c.c. of oil is injected, an equal amount of air is aspirated and the intrapleural pressure is occasionally determined by the manometer. When underlying fluid is being aspirated the patient is placed in the sitting position and the needle is inserted low. Here, as in the aspirating of any fluid, the intra-pleural pressure has to be watched.

In empyemata when there is no tendency for the lung to re-expand, complete filling of the pleural cavity with oil is not necessary, but in ineffective and obliterative pneumothorax a complete blockade is desired, otherwise any remaining air is absorbed and the intra-pleural pressure and collapse of the lung are less than required. Filling up this space with oil, or constantly refilling with small amounts of air is then necessary. It is said that the oil can be left in the pleural cavity without harm for two or three years. In our empyema cases when pus continues to re-form we clean out the cavity completely every six or eight months, wash out with saline, and then replace fresh oil. In other words just as we give "free air" to pneumothorax patients, we "change the oil" of those who are treated by oleothorax!

In this series of 25 cases, the average age was 28 years, the youngest 15 and the oldest 58. The average duration of pneumothorax treatment before oleothorax had been 22

months; 21 of the 25 had had a previous pleural effusion, either serous or purulent.

Fifteen of the 25, or 60 per cent, had no appreciable reactions, and 10, or 40 per cent, had reactions. Reactions were usually shown by elevated temperature, pain in the chest, malaise and the formation of an effusion usually occurring within the first 24 hours, though one was delayed for seven weeks. In one the effusion became purulent, but has since cleared. One developed a broncho-pleural fistula. Of the 25, the average duration of oleothorax has been nine months, although half have had it more than a year.

The indications in this series were as follows:

Empyema (three of these with ineffective pneumothorax) .....	12
Ineffective pneumothorax .....	7
Obliterative pneumothorax .....	4
Mobile mediastinum .....	1
Broncho-pleural fistula .....	1
Total .....	25

The results should be considered separately for each of the above groups, but before doing this we may review the whole series. Thirteen, or more than half, were improved, 2 markedly improved. In 8 there was no improvement; 1 is now worse; 1 left against advice soon after the treatment was begun; and 2 are dead.

Of the 12 empyemata 7, or 58 per cent, were improved, 2 of these being practically cured. five were not improved. Of the 7 with an ineffective pneumothorax, only 2 were improved, 4 were unimproved, and 1 died. In the 4 in which oil was used because of an obliterative pneumothorax the results were better, 3 being definitely improved. The one oleothorax to stiffen a labile mediastinum has resulted in improvement.

Those with empyema who improved were in fair general condition, and had a recurrent and not very toxic purulent effusion of at least a few months' duration. All had tubercle bacilli, but either few secondary organisms or none. All who did not improve had more acute, secondarily infected, toxic empyemata, and required open or closed drainage or thoracoplasty. In these very toxic cases, if improvement does not soon result from oleothorax it should be discontinued and adequate drainage provided. In an old, thickened empyema residual cavity of many years' standing after thoracoplasty, when the pus was bloody and the pleura "sore," the

oil was soothing, but otherwise no change was noted.

With an ineffective pneumothorax, if an apical cavity is large and completely adherent and the pneumothorax only basal little or no improvement can be expected. Even with a fairly free collapse, if the adhesions are large and firm it is usually impossible to close or reduce the size of the cavity. A broncho-pleural fistula is more liable to develop in this type of case, especially if there is underlying gross disease. When a pneumothorax that has been effective is gradually being lost, oleothorax does seem of definite benefit in preventing farther re-expansion of the lung. In such cases the outlook is generally better anyway. Some writers on the subject consider the presence of a broncho-pleural fistula an indication for oleothorax. The one patient in this series with a broncho-pleural fistula was a man of 58 admitted with advanced pulmonary tuberculosis, a chronic spontaneous pneumothorax, small empyema and bronchial fistula. The oil was just spat up, so, after four attempts, the treatment was discontinued. If the fistula is small and not of long standing possibly oleothorax may be of benefit.

#### CASE 1

W. H., aged 15, was admitted with gross, acute disease in left lung and moderately advanced in right. Pneumothorax on left side was followed by spontaneous collapse and empyema. Aspirating and irrigating with Dakin's relieved the acute phase somewhat, but fever and purulent effusion persisted. All pus was aspirated and replaced by 200 c.c. of olive oil with 5 per cent gomenol. The temperature immediately subsided. During the next month, 600 c.c. of oil was given. Improvement generally was marked. After nine months, oil was aspirated, and only a very small amount of pus. The olive oil has been replaced and improvement is continuing.

#### CASE 2

W. D., aged 35. After two years of unsatisfactory pneumothorax, oleothorax (gomenol, 5 per cent, in paraffin oil) was begun. There was reaction, and a serous effusion developed which had to be aspirated occasionally, but less often in the last six months, as olive oil has been used. Although symptoms have been improved, there is still sputum with bacilli, and thoracoplasty is necessary.

#### CASE 3

R. S., aged 36. Cavitation and disease in left apex were of year's duration, and apical adhesions prevented a satisfactory pneumothorax. Oleothorax had also failed, due to the extent and thickness of adhesions. Thoracoplasty could not be considered because of activity in the other lung, a tuberculous colitis, and a non-tuberculous nephritis. Although the oil seems not to have helped noticeably, it has at least had the negative virtue of doing no harm.

#### CASE 4

M. F., aged 22. After a year's pneumothorax, the collapse was being lost, due to gradual re-expansion and

adhesions, so oleothorax (paraffin oil with 5 per cent gomenol) was begun. In about six weeks fluid had formed, so fluid and oil were aspirated. In three months oleothorax with olive oil was resumed. There has been no further symphysis of the pleuræ, but collapse is still unsatisfactory and slight symptoms persist. Without oleothorax the pneumothorax would have been gradually obliterated, with re-appearance of cavities and symptoms.

#### CASE 5

E. L., aged 20, was admitted with acute extensive disease in the left lung. Pneumothorax was begun right away and a good free collapse secured. Improvement was marked in every way; there was a gain of 20 lbs., expectoration was reduced, but due to immobility of the mediastinum, collapse was insufficient and about half an ounce of sputum persisted. A year later oleothorax (olive oil) was begun. With a severe reaction an effusion developed after the second fill. After the third aspiration of fluid, temperature became normal. Some serous effusion is still present, but the mediastinum is more fixed and collapse more effective.

#### SUMMARY

1. A study of oleothorax based on 25 cases is given.
2. Indications for its use were persistent purulent pleural effusions, ineffective or obliterative pneumothoraces; one case of mobile mediastinum; and one with a broncho-pleural fistula.

3. Olive oil is considered to be less irritating and more absorbable than paraffin oil, hence is the choice as a base, especially in empyemata.

4. Sensitiveness of the pleura should be tested at the beginning by small amounts of oil. In this series 60 per cent had no reaction.

5. Thirteen, or over half the patients, were improved, 9 were unimproved; 1 of the 9 left the sanatorium and so discontinued treatment early, 1 became worse, and 2 died.

6. In seven, or 58 per cent, of the empyema cases there was improvement.

7. It is realized that the series is small and the period of observation short. However, our general impression is that oleothorax is not an easy method of treatment to manage, and requires careful observation and experience, but is of distinct value in some cases.

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### ACRODYNIA\*

BY SANDFORD ENGLISH,

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RECENTLY we have had in our hospital a case of what was thought to be acrodynia. Because of lack of familiarity with the disease it is felt that there are many missed cases. From the standpoint of therapy the recognition is of little value, at this time, to the patient. However, it may be that some day a general practitioner, through familiarity with the disease, may open up a line of thought that will eventually lead to a specific therapy.

Let us first list the various names by which the condition is known:— (1) Swift's disease—so named after Swift,<sup>1</sup> the first to describe the condition; (2) pink disease—so named because of the colour of the hands and the feet; (3) erythrœdema—this was the name given by Swift in his original paper; (4) Feer's disease—after Feer, of Zurich, who described the condition independently in 1925; (5) dermatopolyneuritis—a name given by Thursfield and Patterson, two

English workers; (6) acrodynia—the name generally used on this continent and in Europe, first given the condition by Weston, of Columbus, S.C.

Swift<sup>1</sup> gave us the first description of the condition in any language, in a paper read before the Australian Medical Congress, February, 1914. This paper provoked a good deal of discussion, with the result that many cases were uncovered and men came forward to announce that for years they had seen a similar condition.

Bilderback,<sup>2</sup> of Portland, Ore., has written probably the best historical survey. However, he neglected to tell the story of the frightful epidemics which occurred among adults in Europe in the eighteenth and nineteenth centuries. Between 1828 and 1830 in France between 40,000 and 50,000 people, all adults, were stricken with a condition of painful extremities to which Chardon, of Paris, gave the name, "acrodynia." A similar widespread epidemic arose in England and Belgium years later, and

\* Read at a meeting of the Norfolk County Medical Society, on February 27, 1933.

all of these were ascribed to arsenical poisoning. Bilderback's omission therefore may be excused on the grounds that there is only the relationship of accident of name between the two conditions.

An article called "A polyneuritic syndrome resembling pellagra-acrodynia seen in very young children," by Dr. Alfred Byfield,<sup>3</sup> Professor of Pædiatrics at the University of Iowa, gives us an exceptionally good description of the clinical picture. Canadian writers who have written on it recently are Vipond,<sup>4</sup> of Montreal; Brown,<sup>5</sup> of Toronto; Chown,<sup>6</sup> of Winnipeg.

Clinically, there is a great similarity in cases, but there is, also, a great variation in their severity. Let us describe a typical case.

The child is a picture of abject misery; it cries piteously, more especially when picked up or disturbed. The position in bed it worthy of note. Usually it is the knee-chest position, with the head buried in the pillow, although sometimes the child will be sitting with the head buried between the legs. The outstanding objective symptoms are the colour of the hands and of the feet,—a bright pink or dusky red. Here it should be pointed out that the line of demarcation is not abrupt as in pellagra. Sometimes this pink colour covers the entire body and so may give rise to confusion with scarlet fever. (This was so in a case observed by Dr. A. B. Jackson and myself last summer). Frequently the colour fades and reappears. Desquamation of the hands and of the feet is a very distinctive symptom. The water-logged appearance of the hands and of the feet which Swift called *œdema* is another outstanding bit of clinical evidence. The extremities are invariably cold, but to the patient they appear very hot, so much so that older children will tell you that they wish they could put them in a snow-bank, and some of the younger ones will rub their hands and their feet together for hours at a time. Other skin evidences are a maculopapular skin eruption which sometimes occurs over the trunk and the thighs, and in the early stages, an almost constant excessive perspiration. The nails of fingers and toes frequently fall off; teeth fall out; and the hair occasionally is shed. The gums become swollen and soft, but this is usually ascribed to secondary infection after the loss of teeth. Fever is usually absent unless there is an associated secondary infection. Pain is an outstanding symptom. It is excruciating

in the hands and in the feet, and becomes so distressing at times that the child will, if not watched, bite severely the fingers and toes. Feer,<sup>7</sup> of Zurich, has drawn attention to an overlooked clinical finding, namely, increase in blood pressure.

Associated with this clinical picture is a severe nervous and mental involvement, mania, depression, apathy, insomnia being marked features. The mania is severe and at times the child will fight the nurse or the mother for hours until falling asleep from sheer exhaustion. Sedatives have been found of very little value in the treatment at this point. This is pointed out here to demonstrate the severity of the nervous manifestation in a typical case.

Food is usually refused and gavage must frequently be resorted to.

To keep in mind the clinical picture let us remember the six P's.:—*prostration*; *pares-thesia*; *pink*; *perspiration*; *peeling*; *pain*, to which we might add two more, *photophobia* and *popping*. This latter is an unscientific word which I use to recall the alarming loss of teeth.

Laboratory findings in acrodynia give us little help. The blood is usually normal, although in some cases there is a rise in the white blood cell count. The Wassermann and tuberculin tests are usually negative, and the only finding in examination of the spinal fluid is a slight increase in the amount.

The cause is unknown. Many theories have been advanced: that it is post-influenzal; a deficiency disease; toxæmia, due to the retention of arsenic; a dysfunction of the suprarenals; an infection from a fungus of grains.

The disease is a sporadic one, occurring more frequently in cold climates. No recurrences are reported. It does not occur in adults, is rarely seen after three years of age, although the first case seen by myself was five. Bilderback,<sup>2</sup> had a case seven years of age. It is essentially a chronic disease and lasts from eight to twelve months.

#### CASE REPORT

Baby E. M., aged six months, of Indian parents, was admitted to the service on October 22, 1932, with the following story.

It had been ill two months prior to this admission and had been previously admitted on private service, September 27, 1932, and discharged on October 13, 1932, with the then diagnosis of "infectious diarrhoea and malnutrition, with eczema." The discharge notation states, "Diarrhoea improved; purulent eruptions not improved."

The baby was brought to the hospital this time by the doctor, and there was no admission history because the parents were not present. The only story obtainable was from the physician who brought the child, to the effect that the chief thing noted was an intestinal upset of four days' duration with marked loss in weight.

Examination revealed a thin, poorly nourished Indian baby of about six months, crying lustily if touched or disturbed. The weight on admission was 7 lbs 12½ oz. The hands and the feet were of a dusky red colour, with pustular eruptions around the nail beds, and with two finger nails missing. The feet appeared waterlogged. There was marked coldness in the forearms, hands, the legs and the feet. There was a maculopapular skin eruption over the trunk; the skin was moist. The temperature was normal. The nurse states that since admission the child had refused food. All laboratory findings were normal.

The child was given a suitable feeding mixture by gavage, and ultra-violet rays from a mercury vapour arc lamp, and at the end of five treatments appeared comfortable and took food from the bottle in the ordinary way. On discharge, the weight was 10 lbs. 1½ oz., a gain of two pounds five ounces in seven weeks. The rash on the trunk was cleared, and, except for the loss of one or two finger and toe nails and the still swollen appearance of the feet, was apparently doing well.

I am indebted to Dr. R. B. Hare for the privilege of presenting the case. This child presents most of the features of a child well advanced in the disease. The mother states that it is eating better and may be handled without crying. The hands, and particularly the feet, are still large and swollen. There is desquamation visible on the soles of the feet and they appear cold to touch. This child has been ill for four months and is now about 10 months old. Dr. Hare has been using ultra-violet light from a mercury vapour arc, together with neobovine in the treatment of this case. This presents a new and interesting feature in the treatment. The use of liver extract is now being investigated, and where used is meeting with favourable comment. As yet I have not been

able to observe or to read of a sufficiently large series of cases undergoing this form of treatment to afford ground for comment.

Autopsy findings have revealed but little except an œdema of the central nervous system and a hypertrophy of the epidermis and sweat glands. Warthin<sup>8</sup> describes in detail the findings in two cases.

Treatment depends on the individual concept of etiology. There is as yet no specific. Symptomatic treatment calls for atropine for excessive perspiration; sedatives for the nervous symptoms, although they are of little use. The use of ultra-violet light rays is advocated by Sweet.<sup>9</sup> These he uses in the following manner: five minutes exposure to infra-red rays followed by three minutes of ultra-violet, at a distance of thirty-five inches, with a three-day interval between treatments; and he states that he has never had to use more than nine treatments. Keeping in mind the reports of Warthin, Bilderback states that he has successfully treated the nervous symptoms by restriction of fluids.

Remember then, the six P's, two more of them if you like, and remember, too, that most of the cases get well. Nevertheless, the world of pædiatrics is waiting for some earnest practitioner to give a specific for acrodynia.

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**BREECH PRESENTATIONS AND THEIR DELIVERY.**—According to W. E. Studdiford, breech presentations constitute about 3 per cent of all deliveries according to many authorities. Since 1920, this small group of cases has been the subject of many investigations all over the world. This interest has been aroused mainly by the work of Holland, who called attention to the great frequency of death from birth trauma among babies born with a breech presentation, and by the realization that these deaths were not in the main due to asphyxia. The exact estimation of the fetal mortality due solely to breech presentation and delivery is difficult. The principal factors which render it difficult are that about 25 per cent of these babies are premature, weighing under 2,000 grm., or are macerated; that a large number of fetal anomalies inconsistent with life occur in this group; that a certain number of cases are complicated by placenta prævia. Prolapse of the cord is about ten times more frequent with the breech than with the vertex presenting. With various standards of correction, the fetal mortality directly attributable to the presentation has been estimated to lie between 6.2 and 16.4 per cent.

The anatomical causes of death are well known and consist of intracranial, spinal, intra-abdominal and other traumatic lesions. Such lesions are found in the vast majority of infants who die during or shortly after delivery. In 32 autopsies performed at the Sloane Hospital, 6.25 per cent showed anomalies incompatible with life. Of the remainder, only 6.5 per cent failed to show a serious traumatic lesion. In an effort to cut down the incidence of such injuries, three lines of procedure have been followed. The first, and possibly the most important, part lies in antepartum. The second lies in the proper conduct of labour and a sound technique in surgery. Finally, there is a certain small percentage of cases in which a Cæsarean section is indicated. The accurate estimation of fetal size, especially in a breech presentation, is a difficult matter. Roentgenographic examination is often of great assistance and would be more so if a reliable method could be developed for measuring the baby and the pelvis by means of roentgenograms. The indications for intervention should be failure of labour to progress and evidence of fetal distress.—*J. Am. M. Ass.*, 1932, 99: 1820.

## Clinical Conferences

### SYMPTOMS PRODUCED BY A CALCIFIED AREA (CRANIOPHARYNGIOMA) IN THE MID SUPRASELLAR REGION\*

By LEWELLYS F. BARKER, M.D.,

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When a previously healthy person says that he has developed headaches, that he has vomited from time to time without known cause, and that recently his vision has been disturbed, the alert physician will at once suspect the possibility of a general increase of intracranial pressure, will make his examination with sufficient care to determine whether it exists or not, and, if he find it in evidence, will do his best to discover the cause and remove it.

A patient who entered the Neurosurgical Service of the Johns Hopkins Hospital (service of Prof. Walter E. Dandy) recently gave a history of this sort. The study thus far made has revealed some very interesting symptoms and signs; indeed, we can already be reasonably sure of the existence of a serious intracranial disease, of its exact localization, and of its nature and origin.

#### SUMMARY OF CASE HISTORY

A. G. M., a white male, aged 20, was admitted on March 9, 1933.

*Chief complaints.*—Headaches (occasionally with vomiting) and blurring of vision for three years; ringing in the left ear for nine months.

*Family history.*—Non-contributory, except that the father and two uncles of the patient are said to have diabetes mellitus.

*Past history.*—In infancy, frequent generalized convulsions between the ages of six and eighteen months; none since. Aside from measles and chicken-pox in boyhood, and frequent colds and sore throats (tonsillectomy in 1932), he has had good general health until the onset of the present illness. Habits good. He has gained 28 pounds in weight since his tonsils were removed last year. The patient is right-handed.

*Present illness.*—About three years ago he began to have headaches in the frontal region above the eyes. They were bilateral, though the ache was perhaps more marked on the left side. They recurred at irregular intervals, lasted from five to fifteen minutes, and seemed to be induced by stooping over. When very severe, the headaches were accompanied by vomiting. After six or eight months, these headaches ceased.

About two years ago, the headaches recurred and were similar in character, though they tended to be more left-sided. At times he noticed dull aching in the

occipital region and pains in the lower face. For a year he had frequent nosebleed. He also began to notice "ringing in the left ear" ((without deafness) and "blurring of the print" on reading, which gradually grew more pronounced. Occasionally, his eye-sight would suddenly "fade away," and, on one occasion, about six months ago to his surprise he walked into an automobile that he had not seen; since then he has not gone out alone. During the illness he has noticed coarse tremor of the hands, more marked on the right, and occasionally would spill water from a glass, or would drop something that he had picked up. Recently, he has complained of weakness of the left lower extremity and has had a sensation of "quivering" in the muscles of the right thigh. He describes also sudden attacks of dizziness, of feeling warm all over; in these, "everything goes black," and he is compelled to lie down. Though in these attacks he did not lose consciousness, those who observed him say that "he became stiff all over," and that especially his arms were rigid and extended. After these attacks, he had headache and soreness and stiffness of the neck. His physician noticed six months ago that he sometimes "staggered to the right." He, himself, admits that he tends to fall when putting on his trousers. There has been some impairment of the sense of smell, his memory has grown somewhat poorer, and he has become increasingly nervous and irritable.

*Physical examination.*—Height 5 ft. 7 in.; weight 168 pounds. He is well and proportionately developed, except that his arms are relatively elongated. There are no physical abnormalities, except for dental caries and the findings on neurological examination. The patient is alert and intelligent; his memory for recent events slightly impaired; he recognizes the odour of turpentine and ether, but not of tobacco or menthol. No eye muscle paralyses are present; no nystagmus; the pupils react promptly; bilateral papilloedema present (discs elevated 2 or 3 D), but the patient can read fine print with each eye. Hearing is normal. There are no demonstrable paralyses or sensory loss in the trunk or extremities. On tests of co-ordination on the right, the finger shows coarse irregular tremor on approaching the nose, but otherwise there is no evidence of spinal or cerebellar ataxia at the time of examination. The deep reflexes are markedly hyperactive, with a tendency to clonus, most in the lower extremities and somewhat more on the right than on the left; the corneal, abdominal and cremasteric reflexes are active and equal on the two sides; Babinski and Oppenheim negative on both sides. The systolic blood pressure has ranged from 140 to 160 mm., the pulse rate from 70 to 80, and the body temperature from 99° to 100° F.

*Laboratory tests.*—Wassermann test negative; non-protein nitrogen 30 mgrm. per cent; sugar 96 mgrm. per cent; CO<sub>2</sub> 71.1 vols. per cent. Urine negative, except for a trace of a reducing substance that is non-fermentable; no polyuria.

*Ophthalmologist's report.*—Marked elevation and oedema of both discs; disc margins obliterated; veins moderately engorged; discs of greyish colour, but with no evidence of optic atrophy. Fields of both eyes are normal for both form and colours, but blind-spots in both eyes are enlarged. *Impression:* Bilateral papilloedema, due to increase of intracranial pressure.

*X-ray reports.*—Skull: A large calcified area in the middle line in the suprasellar region. Sella moderately enlarged, at the expense of the sphenoidal sinus. Line from nasal spine to tip of ear passes through the floor of the sella; dorsal wall of sella thinned. Convolutional atrophy of cranial wall increased; widening of sutures of the skull.

\* Thursday Clinic to the Senior Students of the Johns Hopkins Medical School, March 16, 1933.

## DISCUSSION OF THE FINDINGS

That the initial symptoms of headache and vomiting were, in reality, due to increased intracranial pressure now seems obvious in view of the other findings, despite the fact that the headaches did cease for a time. The *headache* in the syndrome of increased intracranial pressure is believed to be caused by stretching of the dura mater and irritation of the branches of the N. trigeminus that innervate the dura. That the headaches were somewhat more marked in the left than in the right half of the skull may mean that the left lateral ventricle was more distended than the right. Ventriculograms have not yet been made. The *vomiting* was evidently of cerebral origin (irritation of centres in the medulla oblongata), as it accompanied exacerbations of the headache and both headache and vomiting were at times precipitated by "stooping over."

The *bilateral papilloedema*, as well as the enlargement of the blind-spots in both eyes, and the report of occasions when the eye-sight would "suddenly fade away" must also have been due to the increased intracranial pressure, especially in the absence of retinitis of any sort and in the presence of intact visual fields. The *tinnitus* and the *dizziness* have doubtless been due to stasis in the labyrinth induced by the general increase of pressure within the skull. It is quite possible, too, that the *slight reduction of olfactory sense* and the *disturbance of the recording faculty* (impairment of memory for recent events) were also a part of the general pressure syndrome since they are not infrequently met with as expressions of it. But as there has been a jocular tendency with slight euphoria the possibility of local pressure upon the frontal lobes must be kept in mind.

In the roentgenograms of the skull the exaggeration of the convolutional markings (*impressiones digitatæ*) and the widening of the cranial sutures are very characteristic signs of general increase of intracranial pressure that has continued over a longer time. The finding of a *large calcified area in the middle line in the suprasellar region* gives the clue to the origin of the increased general pressure (perhaps through production of an internal hydrocephalus), and of the local pressure that has widened the sella turcica, thinned out the dorsum of the sella, and made the floor of the sella encroach upon the sphenoidal sinus. Other

neighbourhood symptoms, due to the pressure of this partially calcified mass, are suggested by the evidences of peduncular disturbance. Thus the hyperreflexia on both sides and the weakness of the left lower extremity would seem to point to slight compression of the pyramidal tracts (more on that in the right peduncle than on that in the left), and the slight incoordination, the staggering to the right, and the coarse muscular tremors may point to disturbance of the fronto-ponto-cerebellar paths by the interpeduncular mass, or possibly (along with the attacks of rigidity and extension of the upper extremities) to the pallidum. Of unusual interest is the occurrence, recently, of a *gain of 28 pounds in weight* within a few months, and the slight disturbance of temperature regulation, symptoms that point to the vegetative centres in the hypothalamus, especially to the tuber nuclei. The absence of polyuria shows that the supra-optic nuclei in the hypothalamus (above and anterior to the optic chiasm) have not been injured. In how far pressure upon the stalk of the hypophysis cerebri or upon the gland itself, and in how far direct pressure upon the hypothalamus may have been responsible for these disturbances of the diencephalo-hypophyseal mechanisms, it is not possible to say. But, in any case, the site of the calcified mass would seem easily to account for the origin of these disturbances, as well as for the general increase of intracranial pressure.

*The nature of the calcified mass.*—The suprasellar position of the mass, its calcification, the age of the patient, the existence of bilateral papilloedema rather than any extensive optic atrophy, and the absence of chiasmal lesion strongly support the view that we have to deal here with a tumour or cyst that has had its origin in "rests" of the hypophyseal duct—in other words, with a so-called *craniopharyngioma*. We can, I think, rule out most, if not all, of the other conditions that might simulate a craniopharyngioma at this site. Thus a suprasellar fibro-adenoma, or a suprasellar malignant adenoma, does not occur in a person so young. A true teratoma might occur here, but it would be rare; the majority of tumours of this region described as teratomata have, in reality, been teratoid growths (bone formation within tumours derived from hypophyseal duct rests). A chiasmal glioma can be excluded since that type of tumour is invasive and destructive;

when it grows upward it often injures the region of the supraoptic nuclei, first causing polydipsia and polyuria; besides, there is usually restriction of the visual fields (often a bitemporal hemianopsia). A suprasellar meningioma (fibroblastoma) is rare before the age of 40, causes optic atrophy rather than papilloedema, affects vision in one eye earlier than in the other, and seldom becomes calcified. A ganglioneuroma arising in the tuber cinereum has to be kept in mind as a bare possibility, for such a tumour may cause internal hydrocephalus through block of the third ventricle and may lead to enlargement of the sella and to thinning of the dorsum sellæ; it, however, does not as a rule become calcified. An ependymoma arising in the lining of the third ventricle grows upward, forward, and backward along the lines of least resistance; it would not have enlarged and compressed the sella turcica as the tumour in our patient has. Finally, aneurysm of the internal carotid artery may be found in adolescence, but it is usually bilateral, is not in the middle line in anteroposterior roentgenograms of the skull, and, besides, it has other unmistakable x-ray characteristics.

It happens that a second patient with craniopharyngioma is now in the hospital, and I have had him brought down to the amphitheatre, since the disturbances differ somewhat from those of the first patient shown to you. This second young man is 25 years of age. He stopped growing in height at 12 and the secondary sex characters have never developed. Later on, headaches and vomiting were complained of and later still, disturbances of vision. He developed a marked diabetes insipidus with great thirst and polyuria. On entrance to Dr. Dandy's service a bilateral temporal hemianopsia was found and roentgenograms revealed ballooning of the sella and evidence of general increase of intracranial pressure; some calcified areas above the sella suggested the presence of a suprasellar mass. X-rays of the bones of the extremities showed that the epiphyses were united.

On surgical exploration Dr. Dandy found a mass in the suprasellar region, partly cystic, partly solid. After emptying the cyst he curetted out as much of its walls and of the solid mass as he could. Histological examination showed, I understand, that the tissue was of squamous epitheliomatous type. The symptoms

were much relieved for a time, but recently they have recurred, owing doubtless to extension of the growth from the residues left at the curettement (for it was not possible to remove all of the neoplastic tissue at the operation).

To-day, you are struck with the moderate dwarfism, the appearance of the face (feminine type; progeria), the obesity, the absence of hirci and crines, and the puerile voice. There has been insufficient production of the growth hormone and of the sex hormone by the adeno-hypophysis, accounting for the nanosomia and the failure of puberty to develop. The optic chiasm has been injured and led to bitemporal hemianopsia. The diabetes insipidus must be due to injury of the posterior lobe—hypophyseal stalk—supraoptic nuclei mechanism.

#### COMMENTS UPON CRANIOPHARYNGIOMATA

Since the early studies of Erdheim (1904) upon hypophyseal duct tumours we have learned that there are three main types of these craniopharyngioma:— (1) simple papillary cyst or intracystic papilloma; (2) the adamantinoma-like type (called by Ewing "autochthonous teratoids", since through the changes they undergo they may simulate teratomata); and (3) a malignant spinal-cell carcinomatous type (invasive and metastasizing). Of these, the second type is by far the commonest and is very prone to undergo calcification; it is this type that is present, I believe, in our first patient.

It is interesting that, in 1920, Dr. W. C. Duffy, while working here, made a most careful study of three cases of hypophyseal duct tumour in the service of Prof. W. S. Halsted in this hospital, the clinical observations being made in association with Doctors Heuer and Dandy and the pathological-histological studies in association with Doctors MacCallum and Winternitz. One of them was an intracystic squamous epithelial papilloma originating from a "rest" of the hypophyseal duct in the adeno-hypophysis; the second was a suprasellar cystic tumour (with adamantinoma characteristics) arising from an infundibular "rest" of the duct, and the third was a suprasellar cystic squamous epithelial tumour (with adamantinoma characteristics and with metaplasias and extensive degenerative changes) also arising from a "rest" of the hypophyseal duct. Along with these three cases, he gave a description of a tumour derived from a "rest" of Rathke's

pouch; it was partly a solid adenoma, partly a cyst lined with columnar ciliated epithelium. Up to the time of the appearance of Duffy's paper, the total number of cases known (including his three) was 55. Dr. Harvey Cushing, in his Lister Lectures of 1930, stated that the number had by then grown to 80 (histologically verified); in his review of the craniopharyngiomas he emphasized the great variation among these tumours as regards their position, size, distribution, histological picture, age of onset, and ultimate complications. According to Cushing they are disheartening from the neurosurgical standpoint and offer the most baffling neurosurgical problems. Still, neurosurgery is making very rapid strides and many tumour masses that formerly had to be left alone are now being removed. In the patient here described the relief of the increased intracranial pressure is certainly indicated. Whether or not radical removal of the tumour should be attempted is a matter we shall leave to Dr. Dandy to decide. Roentgen-ray treatment of tumours of this type seems to be of no value whatever.

In the bibliography appended, references will be found not only to articles dealing with hypophyseal duct tumours and the conditions that simulate them but also to papers in which the extraordinarily interesting recent developments of our knowledge of the anatomy and physiology of the hypothalamic vegetative centres are better described. For a quick survey of this fascinating field I can recommend strongly to the clinical reader the paper by J. Beattie on "Hypothalamic Mechanisms" and that by J. F. Fulton entitled "New Horizons in Physiology and Medicine; Hypothalamus and Visceral Mechanisms." From now on, clinicians when studying patients in whom there is evidence of disturbance of central regulatory mechanisms of fat, carbohydrate, and water metabolism, of the vasomotor and secretory apparatus, of sleep, of body temperature, of the emotions or of the sex functions dare not fail to give consideration to the newer studies of the centres

of the hypothalamus and their neural and vascular relations. The central representation of the sympathetic system, on the one hand, and that of the para-sympathetic (or cranio-sacral autonomic) system, on the other, have been fairly well localized in the floor of the third ventricle. As Cushing has dramatically put it, "Here in this well-concealed spot, almost to be covered by a thumb-nail, lies the very mainspring of primitive existence—vegetative, emotional, reproductive—on which, with more or less success, man, chiefly, has come to super-impose a cortex of inhibitions. The symptoms arising from disturbances of this ancestral apparatus are beginning to stand out in their true significance."

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## Case Reports

### RODENT ULCER OCCURRING IN MAN AND WIFE

BY STUART GORDON, M.B., M.S.,

*Toronto*

The following two cases of rodent ulcer, occurring in man and wife, were thought to be of sufficient interest to report.

H.H., aged 37, reported to the Toronto General Hospital in the spring of 1932. He had a rodent ulcer of six years' standing which had destroyed his left lower eyelid. After consultation excision of the ulcer was done on May

half inch below the junction of the left ala with the lip. She insisted that the lesion was identical with her husband's because "for years when he would be going out, I would wipe the crusts from his eyelid with my handkerchief, frequently forgetting to discard it." The soiled handkerchief was thus often used and nothing would convince her that she had not "caught" her husband's disease. Her lesion was excised and proved on section to be a non-keratinizing epithelioma (rodent ulcer). Fig. 2. Both patients were of the same blood group (I. Jansky), which may or may not be of significance.

Three possibilities exist: (1) coincidence; (2) direct grafting of the tumour; and (3) implantation of a virus. Against the first is the fact that both are relatively young. Against the second is the fact that no history of any injury to the involved area could be obtained. As for the third possibility no comment can justifiably be made.

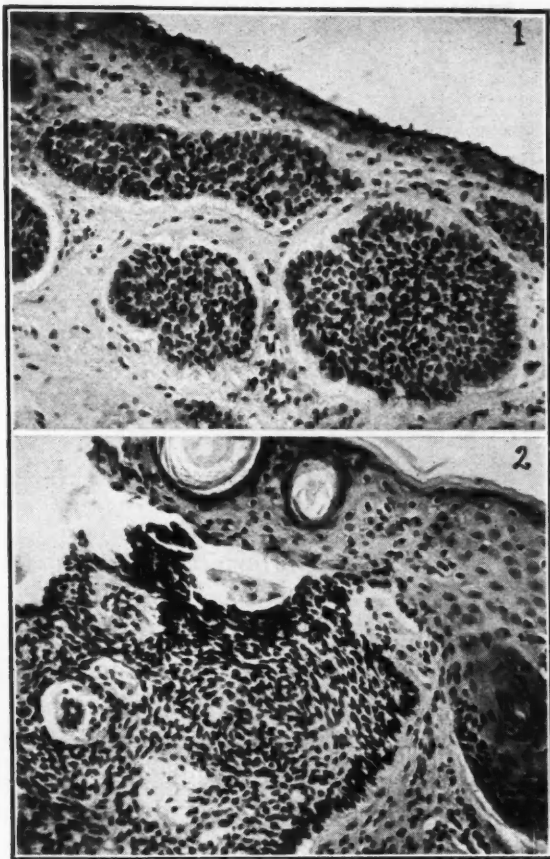


FIG. 1.—Rodent ulcer (H.H.).  
FIG. 2.—Rodent ulcer (C.H.).

21, 1932. The pathologist's report was non-keratinizing epithelioma (rodent ulcer). Fig. 1.

On November 8, 1932, C.H., wife of H.H., aged 32, came to the clinic because of a small yellowish sealing area on her upper lip. The lesion was situated between a quarter and a

### OSTEO-ARTHRITIC PROTRUSION OF THE ACETABULUM

BY GEO. H. MALCOLMSON, M.D. AND  
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The first case of this disease was reported by Otto in 1824 and described as "an abnormal gouty manifestation." Since that time the condition has been variously described as coxarthrolisthesis, osteo-arthritis deformans, tabetic coxarthrosis, intrapelvic protrusion of the acetabulum, osteo-arthritic protrusion of the acetabulum, etc.

The etiology of the condition has been stated to be tuberculosis, gonorrhœa, tabes, lues, metastatic malignancy, the various types of arthritis, etc. The only common agreement seems to be that it is the result of a chronic inflammation. The case to be described supports this theory. The disease is very adequately described by Pomeranz<sup>1</sup> as "Non-traumatic, chronic progressive arthritis of the

hip-joint, characterized by intrapelvic protrusion of the acetabulum and head of the femur." The symptoms are usually pain in one or both hips, limping, and inability to abduct the limbs. Up to date there have been 79 cases reported, of which only 41 are typical. The following case we believe to be a typical bilateral example in a patient suffering from generalized arthritis.

#### CASE REPORT

A male, white, aged 64 years, was admitted to hospital on July 15, 1927. The clinical diagnosis was "stroke", the discharge diagnosis cerebrospinal lues and generalized osteo-arthritis.

*Past history.*—It was stated that the patient had suffered with rheumatism, particularly of the hips, for many years; otherwise negative.

*Examination.*—The patient was completely unable to cooperate mentally. He was able to walk with very short, stiff steps. There was limitation of the movement of both elbows, knees, ankles and hips.

X-ray showed osteo-arthritis of both hip joints. (See Fig. 1).



FIG. 1

This patient was located again in December, 1932. At this time he was completely unable to walk and there was a history of his having fallen down on the sidewalk in 1929. A film taken in 1932, shows evidence of a fracture of the neck of the right femur sustained at the time of the accident.

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#### FOREIGN BODY IN THE LARYNX SIMULATING LARYNGEAL DIPHTHERIA

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The following case presents so many features of practical interest that it is considered worthy of reporting.

On March 30, 1932, at midnight, an infant girl, aged two and a half months, was admitted

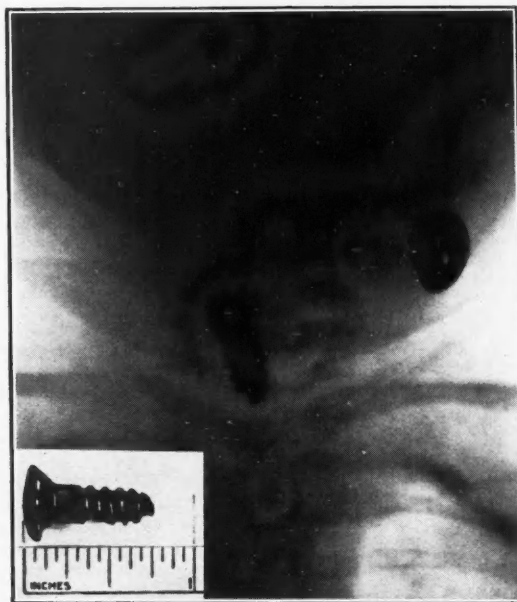


FIG. 1

to the Royal Victoria Hospital suffering from marked dyspnoea, with noisy breathing, discharge from mouth and nose, and prostration.

The patient had been quite well until March 21, when without any warning she became ill. A physician was called, and he diagnosed bronchitis, but although he instituted treatment at once it quickly developed into "bronchopneumonia." In spite of this, however, the child made satisfactory progress. On March 30th at 1 a.m., the child suddenly became worse, developing acute dyspnoea with stridor and very poor colour. A consultant was called in, who diagnosed "croup," and had the patient sent immediately to the Children's Memorial Hospital. Here a nasal smear revealed diphtheria bacilli and the child was given antitoxin (10,000 units) after desensi-

tization. It was then transferred to the Alexandra Hospital for contagious diseases. On its arrival there at 9.15 p.m. the same evening, the baby was given another 10,000 units of anti-diphtheritic serum, as the dyspnoea had become more marked. At the Alexandra Hospital the child's pharynx was carefully examined for evidence of a membrane, but as nothing abnormal was found an x-ray of the chest was taken, in order to see if the signs of pneumonia were still present. This showed evidence of a subsiding inflammation in both lungs, but besides this a large screw was revealed in the region of the larynx, as seen in Fig. 1. Immediately after the discovery of the foreign body the patient was sent by ambulance to the Oto-laryngological Department of the Royal Victoria Hospital, as she was now much worse.

There was nothing abnormal in the family or personal history. The condition of the child can perhaps be best appreciated by quoting the house-surgeon's report on admission, "The patient lies in the semi-orthopnoic position and appears desperately ill. The breathing is very rapid and noisy, about 50 respirations to the minute—colour is poor—the lips are definitely cyanosed—the *alæ nasi* move on respiration. The child is well developed and well nourished—she does not cry and appears to be in a semi-comatose state." The report on the respiratory system was as follows: "The chest is fairly well developed—there is a suggestion of beading of the ribs. On inspiration there is a definite indrawing of the lower intercostal spaces. The percussion note is resonant throughout. The breath sounds are very loud and harsh, with prolonged expiration, and many moist bubbling râles are heard throughout the chest during both inspiration and expiration. No areas of consolidation are found."

Owing to the marked dyspnoea and prostration no time was lost in exposing the larynx by means of an infant-size Jackson's laryngoscope. This was done without anaesthesia and the purulent discharge which covered the larynx removed. Although this procedure required only a minute or two the child's breathing ceased on two occasions. This was due to the fact that the laryngeal obstruction was almost complete and the slightest retraction of the head on inserting the laryngoscope was enough to cut off the airway. After

applying suction, the larynx was examined, but it was so inflamed and oedematous that the normal landmarks were distorted and could not be recognized. In the centre of this angry-looking and swollen tissue, instead of the vocal cords, all that could be seen was a small black object. On closer inspection it proved to be part of the flat surface of the head of the screw, the slit running diagonally.

By means of a pair of alligator forceps the head was grasped and the screw removed without difficulty. Within a few minutes the dyspnoea was relieved and the child's colour improved. The following morning the rectal temperature rose to  $107^{\circ}$ , probably from the trauma of the manipulation, but it soon returned to normal.

On subsequent questioning the father ascertained that an older child, a boy of two and a half years, had placed the screw in the baby's mouth more than 24 hours before it was removed.

The interesting features of this case were: (1) the finding of bacilli resembling the Klebs-Löffler in the nose and pharynx; (2) the large size of the screw found in the larynx of an infant two and a half months old; and (3) the reactionary fever of  $107^{\circ}$ .

The child made an uneventful recovery, and within a few days was discharged from the hospital.

## A CASE OF BLASTOMYCOSIS

By MACLEOD GILLIES, M.D.,

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A case of generalized blastomycosis, discovered and treated at the Manitoba Sanatorium, is of interest because of the great similarity of this disease to tuberculosis, and because it is one of the few cases that have gone on to recovery. A review of the recent literature shows that blastomycosis is much more common than was formerly believed, and that the generalized disease is fatal in about 95 per cent of cases.

The patient, N.M., aged 15 years, was admitted on July 21, 1926, complaining of cough eight to ten times a day; expectoration (one ounce, purulent and blood-streaked); a loss in weight of thirty pounds in six months; pain in

the chest and back; sore throat and hoarseness; epigastric distress; nausea, and constipation.

*Personal and family history.*—His health had been good until February, 1926, when his left foot became sore and swollen. Three weeks later the lesion broke down, discharging dark green pus. About this time the boy began to cough and expectorate. On May 19th, the foot was incised, and the fourth and fifth metatarsal bones removed. They were considered to be tuberculous by the doctor in charge of the case. On June 1st sores appeared on the back of the right leg and right arm.

The patient was an Austrian by birth, having come to Canada when two years old. He had been at work clearing land in the summer, trapping in the winter, and was living in a dark

The patient was transferred to St. Boniface Hospital and the left foot amputated on August 9, 1926. The laboratory report was tuberculosis of the bones and soft tissues. He returned to the Sanatorium on August 30th and his general health improved, but the ulcers on the right leg and arm failed to heal. In November a diagnosis of blastomycosis was made by Dr. D. F. MacRae, and was confirmed by finding blastomycetes in smears and cultures from the ulcers. These were treated locally with 1 per cent copper sulphate solution. Potassium iodide was given internally, and heliotherapy was pushed. All the sores healed in about a month. X-ray films, made January 3, 1927, showed the lungs clear and fairly normal in appearance. A series of intradermal tuberculin tests caused no local



FIG. 1.—Ulcer on calf of right leg.



FIG. 2.—Left foot at the time of admission showing abscesses and extensive destruction of bones.



FIG. 3.—Chest on admission, showing gross disease in left lung, and infiltration in right.

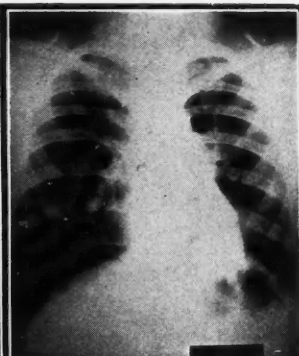


FIG. 4.—Chest on discharge, showing marked clearing in both lungs.

and rather damp log shack. He had had chicken-pox one year before the onset of the present illness. A sister had died of tuberculosis ten months before.

*Physical examination* showed a pale, thin boy. His temperature was 100°; pulse 108. On the right leg and left foot there were large granulating ulcers with a purulent discharge.

The larynx was reddened. In the chest tactile fremitus was slightly increased; there were a few post-tussive crepitations on the left side, but no signs on the right. The x-ray films showed gross disease throughout the whole of the left lung, with bronchopneumonic areas about the root, and fairly widespread infiltration of the whole right lung. X-ray films of the left foot were interpreted as showing an extensive osteomyelitis. No tubercle bacilli were found in the sputum, which was muco-purulent. The urine was normal.

or systemic reaction. The sputum was repeatedly negative for tubercle bacilli, but had ceased before blastomycosis was considered.

The patient was discharged on February 24, 1927, in good health and has remained well since.

#### DISCUSSION

A review of the literature in 1927 conveyed the idea that blastomycosis was a rare disease, found only in central Europeans and negroes, but since that year studies indicate the disease to be quite common, even in the temperate zones. Ferguson and Marett<sup>1</sup> state that in Jersey monilia infections of the lungs are as common as tuberculosis, and that the two infections are very frequently combined. The remarkable similarity of the clinical symptoms, gross and microscopic lesions, to those of tuberculosis, is stressed; only by finding the organism in the

sputum discharges or by microscopic section can the diseases be differentiated. Healy and Morrison<sup>2</sup> state that sputum should not be considered negative for yeast organisms unless cultures are negative. Studies in the histology of the lesions of blastomycosis and tuberculosis have been reported by Miller,<sup>3</sup> Medlar,<sup>4</sup> D'Aunoy and Bevan,<sup>5</sup> and others. A careful investigation of the cultural characteristics of blastomyces and similar fungi has been made by Castellani<sup>6</sup> and Michelson.<sup>7</sup> A book "Fungous Diseases," by H. J. Jacobson,<sup>8</sup> published recently, presents a complete picture of all these organisms with the diseases and lesions produced by them.

Localized cutaneous infections of blastomycosis are common and benign. Systemic infections are fatal in 95 per cent of cases. A specific allergic response to moulds is thought to account for this high mortality in generalized disease. The roentgenogram always indicates a far graver condition than is shown by a physical examination of the patient. The coincident onset of symptoms in pulmonary and other areas is very suggestive of a non-tuberculous condition in what is otherwise clinically a tuberculosis picture.

The literature shows no particular treatment for blastomycosis to be really efficacious. Potassium iodide, up to 30 grains t.i.d. and vaccines, are advocated. In our case the early amputation of the foot, the worst focus of disease, apparently enabled the natural defences of the body to overcome the remaining disease.

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## ANTERIOR DISLOCATION OF THE OS CALCIS

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The following case represents an extremely rare injury. The fact that, presumably in consequence of repeated insult, acute bone atrophy (Sudeck's) occurred, makes it of greater interest. The response of the condition of acute bone atrophy to protected weight-bearing also deserves attention.

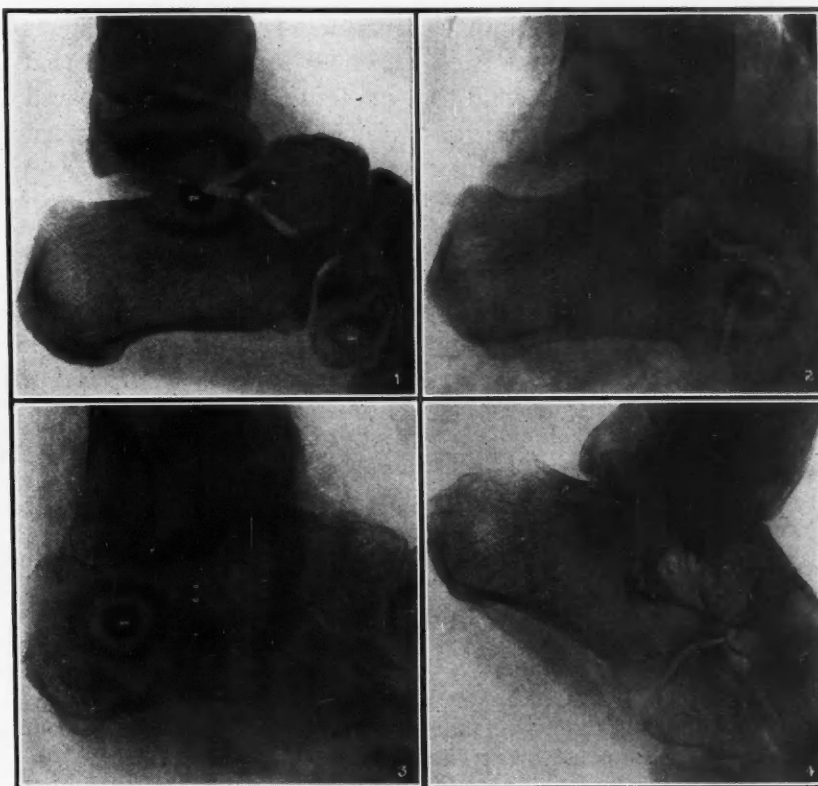


FIG. 1.—December 14, 1926, displacement forward of os calcis, associated with fracture of neck of astragalus.

FIG. 2.—December 17th; result of second operation.

FIG. 3.—March 21, 1927, acute bone atrophy (Sudeck's) is well marked.

FIG. 4.—July 5th; absence of patchy atrophy and recalcification of bone well established.

## CASE REPORT

V.T., 21 years old. On November 30, 1926, this man fell from a height and injured his left foot. He was admitted to my care at the Western Division of the Montreal General Hospital one week later. Radiological examination of the left foot showed that he had suffered a fracture of the neck of the astragalus, together with a forward dislocation of

the os calcis upon the astragalus (Fig. 1). The displacement forward of the foot measured approximately 3 cm. On December 16th open reduction was attempted, following failure to bring about a change in position by manipulation. X-ray examination following this first operation proved reduction to have been unsuccessful. The wound was, therefore, re-opened on December 20th, when fairly adequate reposition of the foot and bone fragments was brought about (Fig. 2). Plaster of Paris was applied and re-applied during the following two months.

Acute bone atrophy was evident early in February, and although a walking plaster was applied without padding, it responded but slowly. An x-ray photograph, taken on March 21, 1927, showed the condition of acute bone atrophy to be marked (Fig. 3). The plaster of Paris was removed on July 1st, and the man urged to walk on the injured foot, protection against a valgus deformity being afforded by the tilting of the inner border of his shoe five-sixteenths of an inch.

The man was last seen by me July 11, 1927. At this time examination showed ab-

sence of swelling of the leg and foot. The fore part of the foot was slightly stiff only. Complete subastragaloid fixation was evident clinically. Since this ankylosis had occurred with the os calcis in slight adduction, a definite, though slight, varus deformity was present. Limitation of ankle-joint movement was present, more particularly in plantar flexion. Dorsiflexion was possible to a right angle. The man was able to walk with but little pain and he was discharged from active treatment to return to work. Since his place of occupation was far removed from Montreal, it has been impossible to obtain information from or about him since this time.

X-ray examination on July 5, 1927, (Fig. 4), showed that patchy bone atrophy had entirely disappeared, although the bones of the foot as a whole were less dense than normal. It appeared as though union of the neck of the astragalus was incomplete. This, however, I believed to be of trivial importance, in view of the fact that a subastragaloid ankylosis had occurred. That this latter condition was present was evident from x-ray as well as clinical examination.

## Clinical and Laboratory Notes

### CONTINUOUS GASTRIC LAVAGE

BY JOHN A. HILLSMAN, M.D.,

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The emphasis placed in literature upon the use of the stomach-tube is much milder than that which the individual surgeon or clinician places upon this highly useful instrument. Devised in 1812 by Philip S. Physick,<sup>1</sup> and independently by Jukes<sup>2</sup> in 1822, as a means of relieving the stomach of poisons, taken accidentally or otherwise, its field of usefulness was indeed limited. Even in this capacity it was not fully appreciated, as Goddard<sup>3</sup> in 1834, while introducing a lavaging pump of his own design, speaks of emesis, artificially produced by drugs, as preferable. The first clinician to realize completely the possibilities of the stomach tube was Küssmaul<sup>4</sup> who, using an apparatus designed by Wyman<sup>5</sup> advocated and practised gastric lavage in cases of pylorospasm and carcinoma of the pylorus. Küssmaul claimed his best results in cases of pylorospasm, using the tube first daily and gradually lengthening the interval between lavages. It is inter-

esting to note that so fearful was this great scientist of the results that might follow the passage of a gastric tube that he first introduced the tube into the stomach of a professional sword-swallower before attempting the procedure on his own patients.

From 1869 to 1893 gastric lavage was considered either too serious a procedure to use, or the true value of Küssmaul's work was not appreciated, as we find no further literature upon the subject. In 1893, Herbert Lund<sup>6</sup> reported three cases of strangulated hernia in which he used gastric lavage in the pre-operative treatment and called the attention of his contemporaries to its value. Fowler,<sup>7</sup> in 1894, advocated gastric lavage in the treatment of peritonitis following appendicitis. Following these two articles gastric lavage is frequently mentioned in the literature as one of the means of combating peritonitis and intestinal obstruction. The procedure however was apparently considered of little importance and was advocated only as a pre-operative measure. At this period the duodenal tube was devised by J. C. Hemmeter<sup>8</sup> and developed by Kuhn, Einhorn, Rehfuess and others. Jutte,<sup>9</sup> in 1912, used repeated duodenal lavages to combat chronic

illnesses of various natures, such as asthma, bronchitis and hay fever. Bassler,<sup>10</sup> using Jutte's tube, advocated its use in ileus and intestinal obstruction, and for the first time placed strong emphasis upon its importance. Oder,<sup>11</sup> in 1923, modified Jutte's tube and attempted repeated lavages by means of a hand-syringe. He likewise strongly recommended this procedure particularly in the cases of post-operative vomiting and ileus. Matas,<sup>12</sup> in 1924, using an apparatus similar to Oder's, likewise urged its use for cases of post-operative vomiting and intestinal obstruction. In this same article Matas

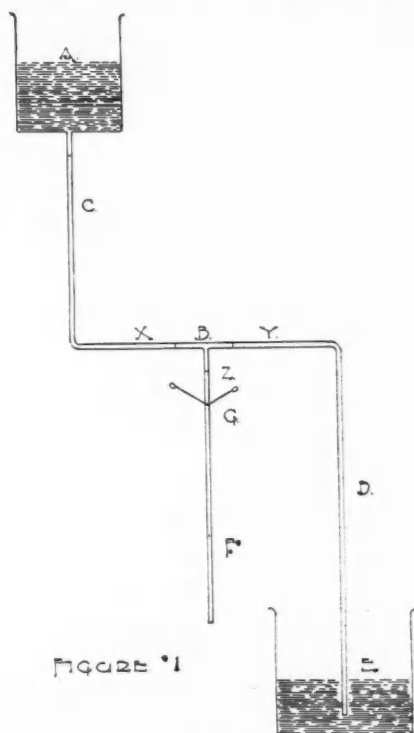


FIGURE 1

stated that the body temperature could be raised or lowered by using lavaging fluids of varying degrees of temperature. The most important step in this form of therapy came in 1925, when Ward,<sup>13</sup> working on the idea of continuous gastric lavage, devised an apparatus which sought to create a continuous inflow and outflow of lavaging fluid to and from the stomach. This apparatus is successful in the majority of cases, but has some disadvantages. In the first place Ward's apparatus is entirely too complicated, and in the second place the tube he introduced into the stomach is too small to allow the passage of mucus and formed material from the stomach. Since the introduction of Ward's apparatus other investigators have constantly tried to improve upon the original design. The apparatus which I wish to describe has been used successfully a number of years, and, owing to its simplicity, is, I believe, a distinct improvement. (See Fig. 1).

In this improved method a colonic irrigation tube (F), size 22-24 French, is passed through the nose into the stomach. Two pieces of cord

(G) to the ends of which are attached rubber bands, are tied to the upper end of the colonic tube. These rubber bands serve to go over the ears and keep the tube in place. The colonic tube (F) is now connected to the lower arm of a "T" glass tube at (B). To the lateral arms of the "T" glass tube two lengths of rubber hose are attached. The first of these rubber hoses (C) connects the colonic tube to an overhead irrigating can (A). The second rubber hose (D) passes to a bucket (E) which rests upon the floor beside the patient's bed. After placing the colonic tube in the stomach through the nasal route and adjusting the rubber bands over the ears a hæmostat is clamped at point "X", and the container (A) is filled with the lavaging fluid. By shifting the hæmostat from point "X" to "Y" the fluid is permitted to pass into the stomach. By shifting the hæmostat momentarily from point "Y" to "Z" the fluid will run from the container (A) through the tube (D). If the hæmostat is now shifted from point "Z" back to point "X" the column of water in the tube (D) will start syphonage, and the stomach contents will pass out into the bucket beside the bed. The procedure may be done by the nurse who has only to keep the container (A) filled with the lavaging fluid and shift the hæmostat to points "Y", "Z" and "X" successively. The effect of the continuous syphonage also permits the patient to drink freely of any fluid which will pass through the colonic tube as this fluid will be immediately evacuated. The patient thus aids in washing out his own stomach, and at the same time, in some unexplained manner, obtains considerable relief from his extreme thirst.

The beneficial results derived from gastric lavage are probably of three varieties. The early idea of the beneficial result of removing toxins from the stomach before absorption is probably the least important of the three. Certainly in cases of high obstruction this toxicity has been proven to be non-existent, and that the cause of death is due entirely to biochemical upset. In the low obstructions where a definite toxin is believed to be present the area drained by gastric lavage is of relatively small significance. In removing irritative substances from the stomach and stopping the continuous retching of the patient we have a factor which is probably of more importance than the removal of a hypothetical toxin. The continuous retching seen in some pathological conditions is bound to reflect in a harmful manner upon the physical existence of the patient. The third possible beneficial result of gastric lavage is a purely theoretical one, but is probably the most important of all. For some time investigators have suspected that in the cases of extreme distension the lack of peristalsis has in some way been associated with œdema of the intestinal wall. The use of

intravenous hypertonic solutions in ileus is directed at the relief of this œdema and is undoubtedly efficacious in some cases. It is also a possibility that the increased abdominal pressure from marked abdominal distension plays an important part in this œdema of the intestinal wall by compression of the local veins or lymphatics. The relief of this intra-abdominal pressure is very possibly the most important result attained by continuous gastric lavage. At any rate we know clinically, at least, that this procedure does have a beneficial effect upon a number of conditions, the most important of which are post-operative vomiting, ileus, intestinal obstruction, and the marked distension seen with some cases of lobar pneumonia.

In using this apparatus over a period of six years a number of objections to its use have been considered. The more important of these is that by the removal of the gastric content there is a tendency toward alkalosis. This objection is more fancied than real. The cases in which alkalosis has been observed are cases in which the vomiting, if allowed to persist, would have produced this condition anyway. The introduction of isotonic sodium chloride, either subcutaneously or intravenously, will offset this condition in any event. There is also a tendency on account of the small size of the tube introduced through the nose for it to occasionally pass down the larynx instead of the œsophagus. This tendency is reduced to a minimum if the head is kept well flexed while passing the tube. Further precaution should also be taken of listening for respiration through the tube after its passage and immediately withdrawing it if there is any doubt as to its situation. Also, occasionally, ulcerations are seen in the nose, and once a small ulceration of the œsophagus was met with after prolonged use of this apparatus. This objectionable feature has been overcome by the placing of nasal drops of mineral oil around the tube in the nose and by having the patient swallow half an ounce of mineral oil three times daily while the tube is in place. The passage of the tube by the nasal route instead of the oral is not objectionable, but is rather welcomed by the patient who has experienced the oral route. In this manner the gag-reflex is not stimulated to anywhere near the objectionable degree that is seen by the oral route. Further, the patient is able to drink freely with the tube in the nose, and it may be left in without discomfort for as long as 72 hours, thus obviating the necessity of passing the tube frequently.

As a means of controlling body temperature the apparatus is of doubtful value. When used in cases of hyperpyrexia, with a lavaging fluid of a temperature lower than that of the body, it is undoubtedly an efficient means of

lowering the body temperature, yet it is very doubtful whether this is desirable in most cases of hyperpyrexia. The fact that splanchnic thrombosis has been observed in autopsies following continuous lavage with ice-water also indicates an element of danger in this procedure. It is possible, however, that it may be useful in those extreme cases of hyperpyrexia seen following injuries around the basal ganglia. The use of this apparatus with a lavaging fluid of a temperature higher than that of body temperature has also been advocated in conditions such as extreme shock. Its value is very questionable here also. The efficiency of this heat regulating property is easily understood when one considers that it simulates an internal refrigerating system in the vicinity of the splanchnic vessels, the heart, the aorta, the vena cava and the liver.

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### THE TECHNIQUE FOR STAINING THE TUBERCLE BACILLUS IN THE SPINAL FLUID

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AND

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The technique for finding the tubercle bacillus in the spinal fluid in cases of early tuberculous meningitis has always presented enough difficulty to make any improvement in the technique worth while.

The usual method of collecting spinal fluid in ordinary test tubes and allowing it to stand until the film had formed, pouring the film into a Petri dish with some saline solution and spreading it on a slide certainly gave good results. In spreading the film, however, it was apt to get rolled on itself, and it was a matter of great care, with a large element of luck, whether we got a 50 per cent film or not. In the Neurological Department of the Royal Victoria Hospital we have devised a method which in our experience gives 100 per cent perfectly spread films.

*Method.*—In a small Petri dish with a glass cover, a clean cover slip is laid on the bottom.

The spinal fluid is collected in the Petri dish—usually 10 to 15 c.mm. is sufficient—and the dish is immediately placed somewhere at room temperature where it will not be disturbed for several hours. The film will form on the cover slip. The cerebrospinal fluid should be gently pipetted off, when the cover slip can be lifted out and fixed and stained in the usual way. A filter of absorbent cotton in the mouth-piece of the pipette should guard against the danger of inhaling organisms.

This method is applicable in cases of meningitis where a film forms. It is of advantage before drying or staining the film to place the cover slip, with the film up, on a glass slide without Canada Balsam and examine the character of the unstained cells under a microscope.

### PSORIASIS AND GOLD SALTS

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Gold has been used in the treatment of psoriasis since 1925, but the reports on its use are neither very numerous nor uniform in char-

acter. Some have obtained encouraging but uncertain results. Nicholas, Mollard, Lebeuf, Hufschmidt, Toomey and Ritter observed rapid and continued disappearance of the condition. Gougerot, Cartaud, Pieltain and Throne noted improvement. Simon, Burnier, Lotte, Andrews, Kingsbury, Myers, Pusey, etc., mentioned the dangers attending the use of gold salts and stressed their limited usefulness in the treatment of psoriasis.

We wish to report briefly the results obtained in a few cases of psoriasis treated with gold in the Dermato-Syphilology Clinic of Nôtre-Dame Hospital. Crysabine, the double thiosulphate of gold and sodium, containing about 37 per cent of gold, was used in all the treatments. The salt dissolved in sterile distilled water, was given intravenously at weekly intervals. The initial dose was 50 mgrm. with a maximum of 150 mgrm. for children and 200 mgrm. for adults.

Sixteen patients were used, without choice. Their ages varied from 10 to 49 years; 6 were males and 10 females. Their condition had lasted from 1½ to 28 years. All had previously been treated locally, and most of them had had more or less lasting remissions or improvements. In 7 of the patients, the eruption was localized, 9 generalized. The general health of the group

Numbers	Name	Age	Distribution	Duration Years	Number of Injections	Total Dose G.	Reactions	Results
I—[3937]	Mrs. L. R. (35 years)		Generalized	7	10	1.48	Nil	Nil
II—[2761]	Evangeline R. (32 years)		Localized	23	10	1.48	Nil	Nil
III—[3838]	Mrs. Alex. T. (35 years)		Localized	28	7	0.83	Erythroderma	Nil
IV—[3930]	Mrs. Gilbert L. (49 years)		Generalized	25	10	1.21	Nausea. Fatigue	Nil
V—[3822]	Mrs. Eva P. (40 years)		Localized	4	18	2.48	Nil	Improved
VI—[2349]	Laurette G. (10 years)		Generalized	2	12	1.50	Nil	Improved
VII—[2070]	Yvette L. (14 years)		Generalized	3	10	1.40	Nausea	Nil
VIII—[3888]	Phil. B. (25 years)		Localized	1½	17	1.95	Scarlatiniform eruption	Improved
IX—[3966]	Rene M. (25 years)		Localized	5	10	1.50	Nil	New lesions appeared during treatment.
X—[4013]	Emile B. (20 years)		Localized	10	10	1.50	Nil	Nil
XI—[4038]	Colombe L. (28 years)		Localized	12	10	1.60	Nil	Nil
XII—[4045]	Laurette N. (22 years)		Generalized	3	10	1.50	Nil	Cleared. New eruption after 3 months.
XIII—[4098]	Bernard G. (26 years)		Localized	14	16	2.75	Nil	Slightly improved
XIV—[4089]	Charles L. (21 years)		Localized	8	15	2.55	Scarlatiniform eruption	Slightly improved
XV—[4146]	Gerard R. (33 years)		Generalized	16	16	2.84	Lichen planus	Nil
XVI—[4606]	Alice L. (39 years)		Generalized	6	10	1.40	Nil	Slightly improved

N.B.—The numbers in brackets in the first column indicate the department numbers.

was good and none had any other skin condition. The blood Wassermann was negative in each; the urine was free from albumin. During the administration of the gold salts, no other form of treatment was used. The accompanying Table shows the reactions observed and the results obtained in each of our 16 patients.

After reading this Table, one sees that: (1) the number of injections varied from 7 to 18, an average of 10; (2) the lowest total dose was 0.83 g. the largest 2.84 g.; (3) two of the 16 complained of nausea, vomiting and fatigue after each injection; (4) two showed a generalized scarlatiniform erythema, without fever, lasting 15 days; (5) one developed an extensive erythroderma, during which the psoriasis cleared only to reappear as extensively as before one month later; (6) one patient developed an

eruption of lichen planus during treatment, the psoriasis being unchanged; (7) in one case the lesions became more extensive and more profuse; (8) six cases showed slight improvement; (9) in one case only the eruption disappeared entirely; (10) the results and the reactions showed no relation to the total dose.

#### CONCLUSIONS

From this series of cases of psoriasis treated with crysalbine, we believe that:

1. Gold has a very limited effect on the course of the disease; and

2. The treatment is not without some danger.

We may add that all these patients seen between 3 and 5 months after the end of the treatment had psoriasis lesions still, even the one that had been cleared.

## Editorial

### THE SAINT JOHN MEETING

THE sixty-fourth annual meeting of the Canadian Medical Association is now history, and its memory will ever be a pleasant one for those who were fortunate enough to be able to travel to the Atlantic sea-board and enjoy the hospitality of the City of Saint John. More than one speaker referred to the fact that the last meeting of the Association in that city was in 1914, which suggested that meetings in Saint John are synonymous with world events, but not necessarily with those which are catastrophic.

The success of the meeting goes to the credit of the President, Dr. G. A. B. Addy, who had enlisted as chairman of the Committee in charge, Dr. W. E. Rowley, and as secretary, Dr. R. O. Evans. These gentlemen, with the assistance of the committee and the support of the whole local medical profession, arranged a program which ran smoothly from beginning to end. Mrs. G. A. B. Addy had the onerous duties that fall upon the convener of the committee which takes care of the ladies in attendance at the meeting. On all sides were heard words of appreciation of the efficiency of the arrangements, and the kindness and hospitality of the hosts and hostesses. The climate of Saint John in June is most suitable for a convention. The reasonably cool days make for good attendance and comfort at business meetings and scientific sessions.

The temperature is also conducive to the pleasure of those who take care of their health through application to the game of golf. Nor is it too cool to interfere with the plans of visitors who desire to see the beautiful scenery which lies along the rivers near the city.

The meeting got off to a most auspicious start, for at the Executive Meeting, on Monday morning, there was almost a full attendance, all provinces except British Columbia being represented.

On Monday at noon, members of Council were the luncheon guests of Dr. G. A. B. Addy. This was the occasion of the Valedictory Address of the retiring President, Dr. A. Primrose, who then installed Dr. Addy, placing around his neck the beautiful insignia of the office of President. Monday evening, Council were the guests of the Saint John Medical Society at dinner, when the Premier of the Province and the Ministers of Health of the Dominion and the Province were the speakers. Tuesday evening, the New Brunswick Medical Association were hosts at a dinner to Council, and the guest-speakers were Dr. H. F. Munro, Superintendent of Education for Nova Scotia, and Mr. E. J. Henneberry, of Saint John. On Tuesday noon, the Harbour Commissioners kindly gave the visitors an opportunity to view the harbour as well as entertaining them

at luncheon. The scientific program opened Wednesday morning, at which time a formal welcome was extended by the Lieutenant-Governor and the Premier of New Brunswick, and the Mayor of Saint John. Contributing to the program were Sir Humphry Rolleston and Professor Lyle Cummins: the Lister Oration was delivered by Dr. Robert Muir, of Glasgow, to a very large audience, the attention of whose members gave evidence of their thorough enjoyment of Dr. Muir's presentation. Following the Oration, an informal dance was held.

Meetings in Saint John will always be associated with the "river excursion and seafood dinner". Just what this really means

must be experienced. It cannot be properly described; it can only be talked about with emotion by those who have been there.

Much business was covered. The new Executive wasted no time in acting upon instructions from Council in certain matters. The papers were well received. No doubt our hosts and hostesses were glad to speed the parting guests; they had given of themselves so freely in arranging for our enjoyment. They will now be able to relax from their self-imposed task, assured that what they did was well-done and their efforts were appreciated by all those who had the good fortune to be their guests.

GRANT FLEMING.

### THE SURGEON'S RESPONSIBILITY

WE are now at liberty to give the details of the case of *Marshall vs. Curry*, which was recently decided before the Chief Justice of Nova Scotia. The action was defended by the Canadian Medical Protective Association.

In 1929, the plaintiff, a seaman of 43, consulted Dr. Curry, of Halifax, for the repair of a left inguinal hernia, which was duly undertaken. On opening the inguinal canal, however, the left testicle appeared and was found to be grossly diseased; it was enlarged, nodular and softened. The surgeon removed it, both because it interfered with the proper repair of the hernia (the abdominal muscles were not very strong in any case), and because in his opinion its diseased condition was a menace to the health of the patient; a conclusion well borne out by the fact that section of the organ afterwards showed it to contain multiple abscesses. A day or two later the patient was informed that the testicle had had to be removed, but he made no complaint about it until two and a half years had elapsed. He then took action for \$10,000.00 damages, on the following grounds: (a) that the testicle had been removed without his knowledge or consent; (b) alternatively, that there had been negligence in not diagnosing the condition of the testicle beforehand; (c) that in thus removing the testicle an assault had been committed.

At the hearing of the case it was clearly

established that the removal of the testicle was necessary, and that its condition could not reasonably have been diagnosed beforehand. But as far as consent to its removal was concerned it could not be shown that this had been given directly, nor could it be said to have been by implication, as neither party had foreseen the need for it. How then could it be justified? In the opinion of the judge, the justification was to be found either in an assent implied by the circumstances which arose, or in some wider principle of philanthropic or humanitarian nature. There is apparently no formal law as to what a surgeon should or should not do under the circumstances of the case in point. Consent to operation must, of course, be obtained to begin with, but after that reasonable latitude must be allowed. One authority clearly states that in his opinion "if in the course of an operation to which the patient consented, the physician should discover conditions not anticipated, and which, if not removed, would endanger the life or health of the patient, he would be justified in extending the operation to remove or overcome them". The Chief Justice quoted a case in which the patient agreed to an operation on the right ear, but when anaesthetized the left ear was found to be in a more serious condition than the right, and was operated on instead. Action was taken on the ground that permission had not been given for operation on the left ear, and the

patient recovered judgment. Apparently, however, there was no need to assume that the condition of the left ear constituted an emergency, and consent to its being operated on could have been deferred.

On the other hand, two cases were mentioned in which the surgeon was protected by proving that the further operation was necessary, other than that agreed to beforehand. In *Parnell vs. Springle* (1899)<sup>1</sup> the surgeon had advised a minor operation for some uterine condition. But on opening the abdomen he found the ovaries and tubes to be suppurating, one of the tubes being ruptured. Oophorectomy was deemed necessary and was done at once. In the ensuing action the judge held that the surgeon had acted legally and with prudence, and was in duty bound to perform the major operation. In the second case, *Caron vs. Gagnon* (1930),<sup>2</sup> there was a slight variation of the same circumstances. The wife of the plaintiff had undergone and had been benefited by curettage for some chronic uterine complaint. A couple of years later she developed acute appendicitis, and consent to operation for this was given by the husband, with the remark that if she must be operated on, he wished it done "at once and for all". At operation, however, in addition to the diseased appendix, the ovaries were found to be badly diseased and were removed, as in the opinion of the surgeon this would have been

necessary within a short time. Action was brought because permission had not been given for this part of the operation, but the judge held the surgeon not to be liable, as there had been initial consent, and the operation on the ovaries was for the welfare of the patient.

We are glad to say that in the case of *Marshall vs. Curry* the action was dismissed, with costs to the plaintiff. The moral to be drawn is that there should never be any doubt as to the consent for operation having been obtained; and, we may add, if it is over a witnessed signature, very much the better. With evidence of consent the court has always shown that it will protect the surgeon who goes beyond even explicit directions in order to benefit the patient in what to all intents and purposes is an emergency, especially when as in this case, there is no shadow of doubt as to the good judgment and surgical skill of the operator. It is quite conceivable that if in any of the cases quoted the surgeon had done no more than he originally had in mind and had told the patient afterwards that he had left a suppurating ovary or testicle, because he had not been asked to remove it, an action might have been taken on the grounds of malpractice. It only remains to add that since actions as these are as unexpected as they are disagreeable the value of the aid of our Canadian Medical Protective Association cannot be overestimated.

H. E. M.

1. *Revue de Jurisprudence*, 74.

2. 68 Quebec Official Law Reports, 155.

## RECOGNITION OF MEDICAL SERVICES

THERE is no record in Canadian medicine of a situation similar to that which has developed in Winnipeg, and is in course of development in Vancouver. What has happened is that the local medical men of Winnipeg have told the municipal authorities that they will no longer give free treatment to patients who are in receipt of government relief, with certain specified exceptions. In addition to this the general hospitals have been advised that the members of the Honorary Attending Staffs will not provide medical services to patients on relief, again with certain exceptions. Nor has this been done in haste or without due warning. In

February last a scheme was suggested to the municipal council of Winnipeg which provided for a comprehensive and practicable medical service to the unfortunate citizens on relief. The scale of fees which the City Relief Commission was asked to agree to by this scheme was to be 50 per cent of the regular schedule set forth by the Winnipeg Medical Society and the Manitoba Medical Association. But the Council has disregarded the proposal, and the medical men of Winnipeg have therefore decided on the action described.

In Vancouver action on similar lines is being planned. The *Bulletin of the Van-*

*couver Medical Association\** speaks strongly, and not unjustifiedly so, in appealing to the members of the profession to act firmly in the matter: "As our readers know, we have for a long time advocated a firm stand by the medical profession against the exploitation (we can find no milder word that will suit the case), of our good-nature and generosity that has gone on for many years, and, be it said, has gone on largely, if not mainly, because of our own mistaken attitude with regard to this matter."

There is much involved in these protests, and the editorial writer quoted strikes sharply at the root of the question when, after admitting that governments have not enough money to meet all the demands made on them, he goes on to say:—

"What is the remedy for it all? for nobody pretends that the compromise suggested by the medical associations is adequate, or anything more than a temporary arrangement. We cannot but feel that the only answer is some method by which the cost of medical care can be distributed over the whole community by some system of insurance. Sickness is bound to come to every family and every individual at some time, and the doctor is as necessary to the community as the repair shop is to the automobile industry.

\* 1933, 9: 176.

The trouble is that sickness is not evenly distributed—nor is it spread evenly over the life of the individual or family. It comes "in bunches". Another difficulty is the fact that treatment of sickness after it happens is the most expensive and most inefficient method of handling the problem.

We have not yet, as a profession—let us be honest—seriously considered what relief *we* can offer to a harassed community for one of its major problems. All sorts of panaceas are suggested—all sorts of plans brought forward. We are the ones who should make the suggestions and work out the plans. If we leave it to laymen, two evils will arise, or may arise, from any scheme brought forward. One is, as regards ourselves, that we shall run the risk of being forced to accept unfair treatment; the other is equally serious, in fact more so, that the community as a whole will suffer. A cheap, imperfect, hurriedly-conceived scheme can not do good, it may do much harm, and in the long run be wasteful and inefficient; prevention of disease will be ignored, unless those who know its importance are there to emphasize it and to guide the counsels of those who are framing a practical scheme of action."

It may be added that in certain parts of Ontario local governing bodies have provided for payment of these particular medical services, *but not from the federal relief funds*: there has been a steady refusal to apply any part of these to payment of medical services. We hope that the action in the West will help to hasten the adjustment of a situation in which our appeals for recognition have been too long disregarded.

H. E. M.

## Editorial Comments

### A Standard Classified Nomenclature of Disease

This publication, which is compiled by The National Conference on Nomenclature of Disease and published by the Commonwealth Fund, New York, 1933, goes far to fill a long-felt want. Hitherto hospitals, health organizations, and insurance companies have been devising their own nomenclatures, or, if they have adopted an existing one have proceeded to modify it beyond recognition. All this indicates the inherent difficulties in the problem and that there has been need of a central guiding influence. The central authority, for the United States at least, has now been provided. In 1929, the Conference of Expert Statisticians, held in Berlin under the auspices of the League of Nations, initiated a movement to enlist the cooperation of the member nations in an undertaking of this kind, and at the Second International Hospital Congress, held at Vienna in 1931, a special international committee was appointed in order to encourage the carrying out of the idea. The work of the National Conference on Nomenclature of Disease in the United States may therefore be regarded as a preliminary part of an international effort to simplify and facilitate the exchange between nations of information

upon disease and its prevention. In March, 1928, a conference on the nomenclature of disease was held in New York at the instance of the New York Academy of Medicine, at which a number of important bodies, such as the Public Health Service, the Army and Navy Medical Departments, the American Hospital Association, and certain hospitals and medical associations. At this meeting the National Conference on Nomenclature of Disease was formed. The present book is the outcome of its labours.

The system of classification is both topographical and etiological. Each disease or injury is classified in terms of the organ or tissue where it is principally manifested and in etiological terms.

The difficulty in regard to an etiological classification is, of course, that the cause of disease is not known in all cases. The Conference has surmounted this by recognizing three general groups: (1) diseases in which the cause is clearly known; (2) those which can be attributed to some secondary cause; and (3) those whose cause is entirely unknown. The general etiological grouping is as follows:

- 0 Diseases due to prenatal influences.
- 1 Diseases due to lower plant and animal parasites.
- 2 Diseases due to higher plant and animal parasites.
- 3 Diseases due to intoxication.
- 4 Diseases due to trauma or physical agents.
- 5.0 Diseases due to circulatory disturbances.
- 5.5 Diseases due to disturbances of innervation or of psychic control.
- 6 Diseases due to or consisting of static mechanical abnormality (obstruction; calculus; displacement and gross changes in form, etc., due to unknown cause).
- 7 Diseases due to disorders of metabolism, growth, or nutrition.
- 8 New growths.
- 9 Diseases due to unknown or uncertain causes, the structural reaction (degenerative, infiltrative, inflammatory, proliferative, sclerotic, or reparative) to which is manifest; and hereditary and familial diseases of this nature.
- x Diseases due to unknown or uncertain causes, the functional reaction to which is alone manifest; and hereditary and familial diseases of this nature.

Each of these general headings is divided and subdivided down to the single cause, such as *B. tuberculosis* under Category I. The basis of the diagnosis is clinical. It defines the clinical process rather than the structural or functional changes which characterize the disease.

This "Nomenclature" will be of great use for the more accurate compiling of mortality and morbidity statistics, will facilitate card-indexing in institutions, and should be of great help to the busy physician, enabling him to standardize his notes and reports quickly and perhaps aid him to make more accurate diagnoses from the terminological point of view. The "Nomenclature", too, will, we hope, blaze the trail towards an international scheme that will be universally accepted.

A.G.N.

### Smallpox Epidemics

Smallpox is probably the most easily prevented infectious disease in the world. So completely can it be controlled that anyone contracting it might well be punishable in law, much as the inhabitants of Butler's "Erewhon" were punished when they fell ill, and were

treated as ill when they committed a crime. We may therefore permit ourselves to be amazed at the reappearance of smallpox epidemics; amazed, that is, at the persistence and strength of the ignorance and prejudice which brings them about. The last epidemic in Canada was in British Columbia in the early months of 1932. For some time past there had been a faltering in smallpox vaccination, due to anti-vaccination propaganda. The result was an outbreak which affected 56 persons and caused 16 deaths. Many of the cases were of the virulent, confluent type, whose terrible appearance is equalled by few other acute diseases. There are available a number of photographs of these severe cases in Vancouver, and one might almost wish that as there have been pictures exhibiting the horrors of war, so these photos might be used as propaganda against those who would relax the simple yet infallible protection of vaccination.

Elsewhere on the continent also there have been instances of the retribution which so surely follows this stupid, astounding neglect. In Vermont, for example, the fourth smallest State in the Union, with a population of 361,000, there have been reported 254 cases in 1932, an incidence of 70 per 100,000. In the neighbouring territory there was only one case per 100,000, a territory composed of the rest of New England, New York and the Province of Quebec, with a population of nearly 24 million. Vermont has no compulsory vaccination law in its statute books.

The trouble is that we are too apt to take it for granted that the value of vaccination is universally understood. It is not so understood. It must be explained and emphasized and taught, again and again. And as if this were not enough, there have to be reckoned with those peculiar minds who have what can only be described as a constitutional objection to vaccination, either of themselves or of others. George Bernard Shaw one might suspect as belonging to this type, if one should ever suspect him of belonging to any type at all. They have a kind of mental allergy which explodes in reactions of fear or refusal when vaccination or any procedure involving the use of animal serum is suggested to them. It would not matter so much if their refusal to be protected did not help to keep in our midst a disease with such terrible potentialities. H.E.M.

THE IDEALS OF OSLER.—I have had three personal ideals. One to do the day's work well and not to bother about tomorrow. It has been urged that this is not a satisfactory ideal. It is; and there is not one which the student can carry with him into practice with greater effect. To it, more than anything else, I owe whatever success I have had—to this power of settling down to the day's work and trying to do it to the best of one's

ability and letting the future take care of itself. The second ideal has been to act the Golden Rule, as far as in me lay, toward my professional brethren and toward the patients committed to my care. And the third has been to cultivate such a measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and to be ready when the day of sorrow and grief came to meet it with courage befitting a man.

## Special Articles

### THE RESPONSIBILITY OF THE CANADIAN MEDICAL PROFESSION IN NATIONAL DEFENCE\*

By E. S. JEFFREY, M.B., (TOR.),

*Toronto*

It gave me a great thrill last fall to learn that the Canadian Medical Association had formed a section of military medicine. I can remember conversations during the war in which the view was expressed that surely in the future Canada and our profession would take a greater interest in the Services, with a view to a better situation at the outbreak of another conflict. Almost fourteen years have slipped by. The Canadian Army Medical Corps is again a one-horse cart expected to carry the load of a fleet of trucks. No attempt has been made even to study the lessons of the last war which peculiarly affected us, or to record our experiences. It must have been some such thought that stimulated those who petitioned our Council for the formation of this Section, and I venture to speak for all who have been in the C.A.M.C. since the war when I say that its appearance caused a sigh of relief.

To get a proper conception of our responsibilities as a profession in the matter of national defence, it is well to stand back far enough to be able to view the problem in as broad a setting as possible. It is necessary to see where every citizen fits into the scheme of national defence,

what the scheme is, and how it is interwoven with that of the Mother Country.

There is, however, a much wider horizon than this provided by history, but within the scope of this paper it is impossible to go back into the history of Europe in any detailed way to provide a contrast by which we can better judge our present position. Anyone interested in the history of military medicine might endeavour to get a copy of "Notes on the History of Military Medicine," by Lt.-Col. Fielding H. Garrison, Medical Corps, U.S. Army. This little book, now out of print, was published in Washington by the Association of Military Surgeons in 1922. With it and the references given the whole subject can be exhaustively studied. I would like to quote part of the first page of these notes:

There have been throughout history two aspects of military medicine, the professional or scientific, and the administrative. Progress in military medicine as a branch of medical science has turned upon two co-efficients; the advancement of scientific surgery and the advancement of the science of infectious diseases. Bacteriology has done more for this phase of the subject than anything else. The development of medico-military administration as a mechanism in winning victories and in furthering the needs of medical science has turned upon a single factor, namely, the need of any nation for an organized standing army, however small, as a mechanism for its defence in time of need. In past history the fate of every army hastily levied without forethought and preparation has been monotonously the same: faulty sanitation, tremendous mortality from communicable diseases, and disastrous mortality from battle wounds.

I want to emphasize this point in the above remarks, that the development of medico-military administration has turned upon a single factor, the need of any nation for an organized standing army.

The history of medicine, including military medicine, and indeed the whole art of war, is at once seen to fall into two parts: the very brief period since the middle of the last century, and all that went before.

When one tries to gather from history information concerning administrative military medicine, one is at once struck with the very subordinate position which it occupied in army organization, and with the almost servile state of the physician. The reason for this is probably that the brand of medicine and surgery which the doctor had to offer never warranted great respect for his calling, either in its application for the relief of suffering, or in its economic value to the state. There was no great incentive from the professional side to stimulate commanders to devote much effort to administrative medical questions.

During the past two thousand years, for long periods soldiering was a trade that men followed

\* Read before the Section of Military Medicine, 63rd Annual Meeting, Canadian Medical Association, Toronto, on June 22, 1932, in support of a resolution which reads as follows:—

Moved by—Dr. E. S. Jeffrey

Seconded by—Dr. G. W. Loughheed and carried:

That the Executive Committee of the Canadian Medical Association be asked to approve the following resolution, give such instructions, make such arrangement, and provide for such funds as are necessary to have it put into effect at the earliest possible moment:—

1. That a complete survey be made of the medical profession in Canada, in order to obtain the following information concerning every graduate in medicine; name, address, married or single, age, occupation, degrees, where graduated, special post-graduate training, militia training, military experience, rank, preference as to service at home or abroad in the event of war;
2. That cooperation of the provincial societies be asked in carrying out this survey;
3. That a special file be provided for each graduate and be kept up to date. This file shall contain the above information, and shall also contain the expressed opinion of the executive as to the capacity in which the graduate is best fitted to serve on mobilization;
4. That these files when complete be deposited with the Canadian Medical Association, and cross-indexed alphabetically, provincially, and regarding specialties.

as a life-time occupation, hiring out to the highest bidder. They were often homeless vagabonds and a nuisance to the civilian population. There was no tax-payer at home interested in the soldier's welfare. It is only when we come across men who rank as military geniuses that we find serious attempts made to organize for the rescue and care of the wounded.

The date usually taken for the founding of the British army is 1660. However, for two hundred years more medical arrangements for campaigns followed no ordered plan, although we do see a gradual improvement in the lot of the sick and wounded in the field. Their care became a definite responsibility of the Government in the 18th century. One can sense the state of affairs which existed in the latter part of the 18th century in the protest uttered by Dr. (afterwards Sir James) McGrigor in 1794:

It is not only in the sense of humanity but in that of sound policy and real economy that the state should provide able medical and surgical advice for soldiers when sick or wounded. I look upon it to be a part of the compact of the citizens with the state that whoever enters the service of his country as a soldier to fight its battles should be provided with the same quality of medical aid when sick or wounded which he enjoyed when a citizen.

Until after the Crimean War there was an almost incredible public indifference to the welfare of the man who was hired to fight. There was no medical corps in the army; nothing like field ambulances, casualty clearing stations, or the other field formations so familiar to us. The common soldier was still without a friend at home. After the Crimean War a start was made to provide the army with a medical corps, but it was not until 1898 that the doctor was allowed to run his own show as an army officer, assuming ordinary military titles and ranks throughout. In that year the Royal Army Medical Corps was formed.

Before passing on to the period which we might term that of modern medicine, I would like to point out that throughout all previous history what appeared worth-while from time to time in military medicine was on the administrative rather than on the professional side. In Military Medicine in the 19th century, for the first time, the professional aspect came to show such obvious worth that armies with varying foresight were led to study its application to the needs of war. The term "military medicine has now come to include all that pertains to military hygiene and sanitation, military surgery and medicine, medico-military administration, transport, recruiting, training, and field-formation."

During this same period, that is, the 19th century after the time of Wellington, science, which was producing such profound changes in medicine, also revolutionized the whole art of war. This came about through the evolution of the breech-loading rifle, and the advent of

mechanical transport. Military requirements increasingly demanded of the soldier a much higher average mentality than before. The effect upon the personnel of armies is seen in the filling of commissioned ranks by appointment rather than purchase, and in shorter periods of enlistment for the private soldier. Men to whom the competition of civil life was possible, came to enter the army for short periods expecting to return to their homes and civilian occupations. People generally were thus brought into closer touch with the army and naturally took more interest in the soldier's welfare.

With regard to medical administration, the changes which began to appear can best be illustrated by one or two examples. The medical arrangements in the American Civil War were meagre at the start, but the Union army uncovered a giant in Joseph Letterman, who became Medical Director of the Army of the Potomac in June, 1862. This man had great administrative ability. He founded a bearer corps and organized mobile field hospitals in tents, laying down establishments for personnel and equipment. His schemes were quickly adopted by other armies, and it was this organization which the British army had in South Africa.

During the '60's the Prussian, quick to apply the lessons of history, and with a genius for taking pains, caught two of his adversaries napping. In the seven weeks' war of '66, though the Austrian army was previously considered superior to the Prussian, the latter turned up with a breech-loading rifle against the old muzzle-loader, and that quickly told the story. However, there was a good deal of cholera, dysentery, and typhus following the campaign, which brought a sharp criticism of the Prussian sanitary administration from the people at home. As a result, in the Franco-Prussian War, which soon followed, we see for the first time in history an army (the German) losing more men through wounds than from disease. Especially, they demonstrated scientifically the wholesale value of Jenner's vaccination. This satisfactory medical condition was of course favoured by the brilliant tactical successes of the army.

In approaching the South African War, and, notably, what occurred in the British army subsequently, until 1914, I would like to quote the words of Sir William G. Macpherson, as contained in the opening paragraphs of "The Medical History of the War":

For a great number of years the Army Medical Service had little or no experience of wars in Europe or against highly trained and organized Continental armies, although it had constant experience of wars elsewhere and under different conditions. The South African War and the experiences of the Russo-Japanese War, however, made it necessary to review its organization and capacity for dealing with large numbers of battle casualties. Its preparation for war in Europe may be said to have commenced then. At the time of the South African War it was weak in numbers, was barely

sufficient for peace requirements, and possessed no organization for expansion in war. Had this been the state of their readiness for war in 1914, the medical services could scarcely have weathered the storm of public criticism which would have arisen after the first shock of battle, and after the wounded, with their tales of hardship and suffering, possibly of neglect, had begun to flow into the hospitals in the United Kingdom, as would inevitably have been the case, in numbers beyond all previous anticipation and experience. When one scans the columns of reports of Royal Commissions, of parliamentary and other enquiries, with their masses of printed evidence, to which break-downs in the arrangements for the care of the sick and wounded in previous wars gave birth, a prominent contrast is afforded by the singular freedom of the Army Medical Service from adverse criticism during the years of the Great War which was commenced in 1914.

While Prussia spent about fifty years building up her modern medical service, Britain found herself at the end of the South African War with a very poor imitation of a service for a major conflict, and with the threat of a big European war hanging over her. That she was able to produce in ten or eleven years a service which stood the strain of 1914-1918 is a striking illustration of British genius for organization.

Having a standing army, Britain possesses in the War Office a centre for military thought, and in the regular medical service a group of specialists in military medicine, one of whose functions it is to keep the profession informed of previous experiences and what is to be expected in future wars. It is also for them to seek the advice of the profession in the solution of problems which require special knowledge, and to coordinate civil medical administrative machinery and the great volunteer associations for the needs of war. After the South African War we see appearing, as a concrete example of the contact between the R.A.M.C. and the medical profession, the Army Medical Advisory Board, which consisted of medical officers, a representative of the War Office, and a number of civilian physicians and surgeons. The experts in sanitation and in tropical diseases were medical officers. Also an advisory board was formed for the nursing services with a Matron-in-chief on the staff of the Director-General of Medical Services. I have not found that a Military Medical Section of the British Medical Association was ever formed. It did not seem necessary for the civilian medical profession to take such initiative at that time.

I cannot take time to say anything about the way the Royal Commissions and War Office committees went about their work. There was one feature not fully appreciated during the re-organization period which should be noted here. It was clear from what happened during the war that neither the army nor the civilian profession had appreciated the terrific demands which would be made upon the civilian profession for the supply of medical officers; otherwise the civilian professional committees which appeared during the course of the war would likely have been formed in pre-war days. These

committees sprang up through the necessity for supplying the army, and at the same time protecting the quality and quantity of medical service to the civilian population at home. It must suffice to say that as early as March, 1915, the Director-General of Medical Services astounded the British Medical Association with a demand for 2,000 medical men for the army. By January 1, 1918, the number left in civil practice was only 11,482, as compared with 12,720 on military service.

The last war showed us that under modern conditions of transport and rapid communication a government can mobilize and handle huge armies representing practically the manhood of the nation of military age; and hygiene has provided that a state may expect her citizens to have on the whole better health on service than they enjoy in civilian life. Thus when war breaks out every person in the country is affected at once; each must for mutual protection surrender a degree of his peace-time independence and subject himself to that discipline which is necessary for concerted action in the face of a common enemy. The old way of sending forth a professional army and bothering the citizen only in his pocket has gone for the present.

It is worth while studying where the Canadian doctor stands in such a state of affairs. Bear in mind the two aspects of military medicine, the professional, or scientific, and the administrative, and also that the administrative has never amounted to anything except where there has been a standing army. We are at once faced with the fact that Canada has practically no standing army; we depend on our civilian population for defence in time of war. The Medical Service in war is the medical profession of the country. The militia is the framework on which is built whatever force is required. It is true that we have a small permanent force for instructional purposes, and a small permanent Royal Canadian Army Medical Corps. This barely supplies the medical needs of the permanent force and does administrative and instructional duties for the C.A.M.C. It consists at present of 102 all ranks, of whom 36 are officers, including nursing sisters and medical officers to the naval and air branches of the department of national defence. It is also true that Great Britain passes on to us her experience, and we know that what the British officer learns and the British citizen pays for is ours for the asking. Whether this is a creditable arrangement for Canada is outside the scope of this paper. Some words of Gladstone, however, uttered in 1859, might not be out of place. He says:

No community which is not primarily charged with the ordinary business of its own maintenance and defence is really, or can be, in the full sense of the word, a free country. The privileges of freedom and the burdens of freedom are absolutely associated together. To bear the

burden is as necessary as to enjoy the privileges in order to form that character which is the great security of freedom itself.

Is Canada able then to build herself a satisfactory military medical service? With the wisdom of the British army and the R.A.M.C. behind her, I feel sure she can, and there is this stimulating incentive, that if she accomplishes the task, the feat is one that cannot be duplicated in history—that is, the formation of an efficient medical service without the presence of a standing army. We do not need to worry about the quality of the medical attention which we have to offer. The last war has shown that the brand of hygiene, surgery, and medicine which can be applied in modern warfare is the best that the world has ever known. It is the application of our art to the peculiar needs of war that gives us cause for anxiety.

I think it is wise to point out first what it is *not* our responsibility to do. The army is a huge complicated machine, put together for generals to win battles with. Whoever would work with self-respect, with credit to his civilian calling, who would be a help and not a hindrance in such an intricate organization, must have military training. Especially is this true of those who will occupy administrative posts, and those whose duties keep them within the fighting zone. "In military medicine skilful first-aid, prompt evacuation, supplies of food, comforts, clothing, restoratives and shelter, available early for every fallen combatant, are of far greater importance than highly technical skill for the difficult case," (Young). All the physicians and surgeons are of no use if we cannot get the wounded to them and in decent shape. Herein lies the responsibility of the military medical officer. The doctor, as such, however well trained professionally he may be, is of very little use to the modern army. Military medicine is as it were a specialty which cannot be learned in any medical school or hospital; training must be provided by the army at public expense. Everyone who is connected with the task of building a medical service, whether soldier or medical man, must realize this fact. Trained medical officers cannot be provided on demand by the Canadian Medical Association.

On the other hand, the country must pass from a state of peace to one of war without any let-down in the quality and quantity of service to the population at home, in addition to a full supply for the needs of the troops. It seems to me that this is where we as civilians come in, and where this section can function with profit.

1. We can be prepared to tell the Government where in our opinion each member of the profession can best serve after a general mobilization. There is no guarantee that our advice will be taken, but this action will show the country that we have not been neglecting our duty.

2. We can stimulate interest throughout the

profession in military questions, perhaps through the organizing of similar sections to this in provincial and county medical associations. Such sections can provide a measure of military education for those of our profession who cannot enjoy service in the C.A.M.C., and who through such instruction could much more readily become medical officers after mobilization.

3. Every doctor in the country should have a working knowledge of the structure of the army, especially of medical formations and of such corps as the Ordnance and the Army Service Corps. He should be acutely aware of the medical requirements for recruits and the necessity for accurate documentation. Ranks, promotion and pay, the Militia Act, the nature and purpose of military discipline, the duties of medical officers in the field, are some of the many subjects which could be made interesting as well as instructive.

4. We can and must take a continuing interest in the welfare of the permanent and non-permanent forces, and especially the prospects, pay and status of the medical officers thereof. Our interest should include the Officers' Training Corps of the universities, and the Nursing Service. We must try to stimulate suitable members of the profession to take commissions in the forces so that there will be a trained personnel up to the requirements of other branches of the service for peace and war; and lastly, we must take a keen interest in the welfare of all who serve or who have served as N.C.O.'s and men in His Majesty's medical services, for if there is a better friend to the soldier, or better servant to the medical officer, than the stretcher-bearer, I have not met him.

5. We must give thought to the problem of rehabilitating the disabled soldier after a war, so that we may be ready with sound advice for the Government in its endeavour to provide pension schemes which are just and not beyond the ability of the country to pay.

Now it is useless for any doctor to say that he is not interested in this problem of military medicine. The requirements demanded by Sir James McGrigor for the sick and wounded soldier a hundred and forty years ago have become an established fact. The people know what medical attention is provided at home aid they will demand the same for the soldier in the field. Public opinion will force every medical man in time of crisis to take a responsible share in this great public service, and will blame him largely if there is a breakdown. I have tried to show that it is impossible for a civilian doctor to put on a uniform and with that act consider himself a medical officer. It requires long personal contact with army ways before a man can work smoothly in such an intricate machine, but we can acquire some measure of familiarity with army structure and general military problems.

and this equipment will be of inestimable service to the country in time of need.

In August, 1914, we were able to mobilize at Valcartier the medical service for a division and some extra units. In addition a sufficient number of trained officers was left in the districts to assemble the medical staffs for further divisions. The credit for that feat does not go to the medical profession but to those members of it who were officers in the permanent and non-permanent C.A.M.C. during the years 1902-1914. They held fast to their ideal with a self-sacrifice which largely jeopardized their professional careers. The profession as a whole was caught flat-footed. This must not occur again.

I have a great deal of respect for the ability of the Canadian Medical Association to carry through efficiently whatever administrative problems it tackles. If the Canadian Medical Association decides to do its part in maintaining the medical profession of this country in such a state that it will withstand the shock of mobilization without strain, I have no doubt that the job will be well done. The danger lies in not realizing the magnitude of the task. Military men will watch the progress of this section with interest. They will be inclined to rely upon it for a great deal of help. It would be better to do nothing than to provide a structure which in time of need will prove a broken reed.

## Men and Books

### A LETTER FROM FRANCIS ADAMS OF BANCHORY

BY ARCHIBALD MALLOCH, M.D.,  
F.R.C.P. (LOND.),

New York

In February 1919, on a day of sorting pamphlets and books at Oxford, Sir William Osler gave me a duplicate of the Sydenham Society's *Genuine Works of Hippocrates* in two volumes, 1849, translated by Francis Adams. Another book he handed on to me was inscribed by him with my name and "in memory of a great day of cleaning up." It was not until some years later at Montreal, I found that the work had belonged to Dr. W. A. Greenhill, and placed in one of the volumes was quite a long letter from Dr. Francis Adams of Banchory to Dr. Greenhill.

I have just returned the volumes and the letter to the Bibliotheca Osleriana at McGill University, as the possession of them has weighed heavily upon my conscience; not because I had stolen them, for I had not, but I felt sure that had Sir William known about the letter, he certainly would never have let it go, because Adams of Banchory was such a favourite with him. Osler used to speak of the "natural home" of a book or a manuscript, and on this occasion its old home in the Osler Library should be looked upon as its "natural" one.

Speaking of "student-practitioners" in his address, *The Student Life*, which was a "farewell address to American and Canadian students", Osler writes (*Æquanimitas with other Addresses*, Lond., 2nd ed., 1906, pp. 430-431):

A man with powers of observation, well trained in the wards, and with the strong natural propensity to which I have so often referred, may live the ideal

student life, and even reach the higher levels of scholarship. Adams, of Banchory (a little Aberdeenshire village), was not only a good practitioner and a skilful operator, but he was an excellent naturalist. This is by no means an unusual or remarkable combination, but Adams became, in addition, one of the great scholars of the profession. He had a perfect passion for the classics, and amid a very exacting practice found time to read "almost every Greek work which has come down to us from antiquity, except the ecclesiastical writers." He translated the works of Paulus Ægineta, the works of Hippocrates, and the works of Aretæus, all of which are in the Sydenham Society's publications, monuments of the patient skill and erudition of a Scottish village doctor, an incentive to every one of us to make better use of our precious time.

Adams was in every way an ornament to the profession. The best sketch of him that I know of was contained in a paper read by Dr. Charles Singer before the historical section of the Royal Society of Medicine about ten years ago. It was delightful to listen to, and Dr. Singer should be persuaded to publish it. There is a good account of Adams, however, in the *Dictionary of National Biography*. He was the son of a small farmer, and was born at Lumphanan, Aberdeenshire, in 1796. At the age of fifteen he would sometimes devote seventeen hours a day to the study of Horace and Virgil. He graduated M.A. from King's College, Old Aberdeen, then studied medicine there. He went to London, and became a member of the College of Surgeons in 1815, but returned to Aberdeenshire and practised for the rest of his life at Banchory-Ternan, a small village. The University of Glasgow gave him an LL.D. in 1846, and King's College, Aberdeen, the degrees of M.D. and Honorary M.D. in 1856. He died in 1861 and a granite obelisk was erected to his memory. Dr. Adams's wife died early, and left him with a family to bring up. Ella Hill Burton Rodger, in her *Aberdeen Doctors at Home and Abroad*, Edinburgh and London, 1893, quotes the account that one of

Adams's daughters gave of his superintending the children's Greek, Latin, and English studies, and instructing them in the ways of Nature, spending more time with them than one would have thought possible for such a busy doctor. His second son, Andrew Leith, became a doctor too, and an army surgeon, but retired in 1873. To Canadians it is interesting that during that same year the son published *Field and Forest Rambles, with Notes and Observations on the Natural History of Eastern Canada*.

Adams was a first-rate general practitioner, and is said to have been a good practical, skilful operator. "Dr. Adams had always a book which he brought out of his pocket whenever he had to wait at odd times." Somewhere I have read that he retired after an early supper whenever he could, sat up in bed, and read or translated. One of the best writers among medical men, John Brown, has a charming essay on "Dr. Adams of Banchory" in *Horæ Subsecivæ*, (new edition, first series, Edinburgh, 1890). Ella Hill Burton Rodger alludes to "a story of a broken arm in a lonely place being successfully set with the aid of a porridge-spurtle." This is how John Brown pictures it.

SCENE.—A hut in the wilds of Braemar; a big game-keeper fast sinking from a gunshot wound in the lower part of the thigh.

DR. ADAMS, *loquitur*.—"Get a handkerchief, and the spurtle" (the porridge-stick), "and now for a pad for our tourniquet. This will do," putting his little Elzevir Horace down upon the femoral. Gamekeeper's life saved, and by good guidance, the leg too.

The Osler Library possesses Adams's *Arun-dines Devæ; or Poetical Translations on a New Principle*, Edinburgh, 1853, and his "discourse delivered at Banchory, on the Burns' Centenary" entitled, *The Writings of Burns*, 2nd ed., Aberdeen, 1896. Adams spoke on the ornithology of Aberdeenshire at the British Association when it met at Aberdeen in 1859, but his remarks were not published in the *Reports*. We are all obtuse in one way or another, so we must not blame Adams too harshly when we learn that he is said to have refused to believe that we can hear fetal heart sounds. In the *Bibliotheca Osleriana* are also to be found besides the Hippocrates, Adams's translation of *The Extant Works of Aretæus, the Cappadocian*, London, 1856, and *The Seven Books of Paulus Aegineta . . . with a Commentary*, 3 vols., London, 1844-47. The late Dr. J. F. Payne, Harveian Librarian at the Royal College of Physicians of London, wrote in the *Dictionary of National Biography* that the "commentary gives a fuller account of Greek and Roman medicine (to some extent of Arabian also) than is elsewhere accessible in English or perhaps in any modern language."

In another way it is fitting that this book should return to the Osler Library, as already

the collection includes quite a number of works which were owned, edited, or translated by Dr. Greenhill, and one of these was a copy of Daremberg's own translation of Rufus of Ephesus, which he had given to Greenhill. The index to *Bibliotheca Osleriana* (Oxford, 1929) a published catalogue, gives a list of Adams and Greenhill items.

William Alexander Greenhill was born in London in 1814, and was at school under Arnold of Rugby. At Oxford he became a close friend of Jowett, and graduated M.B. in 1839, and M.D. in 1840. He practised for a time at Oxford, but gradually became more and more interested in the Arabic and Greek medical writers. He edited a Latin edition of Sydenham (1844) and translated the works of Rhazes from the Arabic (1847), both for the Sydenham Society. His scholarship was elsewhere recognized, for he wrote articles on Greek and Roman physicians and medicine in Sir William Smith's "Dictionaries." Col. F. H. Garrison, in one of his charming essays, has just alluded to the fact that at Oxford Sir Richard Burton (the celebrated traveller) lived with Greenhill, who started him on the study of Arabic. At Hastings, where he took up work on account of ill health in 1851, he practised and investigated questions of sanitation. Greenhill edited several of the works of Sir Thomas Browne, and these Sir William Osler had in his fine Browne collection. He died at Hastings, in 1894, in his 81st year. He had married a niece of Dr. Arnold, but when he died only a son and daughter survived him. It was said of him: "he was a model worker, despising no suggestion, omitting no detail, evading no difficulty" (*Brit. M. J.*, 1894, 2: 734). His care of detail and critical power might well be studied in his many pencilled marginal notes in both volumes of the "Hippocrates".

The letter runs thus:—

Banchory Nov 27/50

My dear Sir,

I am much obliged to you for so readily undertaking the trouble of forwarding my *appendix* to Dr. Daremberg. When you write to him I will thank you to say that I shall be most happy to become a subscriber for his *Oribasius*, & will endeavour to get some more names in Scotland; I fear however that the number will be but small, as it is to be lamented that there is little taste for the Greek Literature of Medicine north of the Tweed. I am sure that like myself you will be delighted to see the original text of his author.

In his last Letter to me Dr Daremberg suggested that I should undertake a translation either of Galen's *Hygiene* or his *De locis affectis* for the Sydenham society—so at least I understand him to mean, but you know our Gallic friend writes so bad a hand that it is often difficult to make out his meaning. I have now nearly finished the perusal of the latter which I have not read for nearly 20 years past, & I must say it strikes me as being one of the most important works on Medicine which have come down to us from antiquity. It strikes me that if any ancient medical work will take with our professional contemporaries this is the very one, & I

have some thoughts of submitting a proposal to the Council of the Sydenham to undertake a translation of it on the same plan as my *Hippocrates*. What do you think of such an undertaking?

It affords me much satisfaction to learn that you are about to state publicly to the profession your opinion in regard to the merits of my *Hippocrates*, as I am sure you will execute the task with much candor & ability. I find some difficulty however in complying with your request that I would direct your attention to those parts of my work which I think most valuable without incurring the risk of committing a breach of the laws of Modesty. But estimating properly the friendly purpose for which you desire this information I feel that I cannot decline complying with yr wishes, & accordingly I shall now state to you as briefly as possible what I intended my work to be & on what parts of it I bestowed most time & labour—leaving it to yourself to judge whether or not I have succeeded in attaining my object.

My aim then both in my *P. Aegineta* & my *Hippocrates* was to produce a work which would combine scholastic profundity with popularity—that should exhibit the multifarious results of extensive research without perplexing the general reader with an exposition of the irksome steps by which these results had been obtained. In other words my purpose was to erect a lofty structure & studiously conceal the scaffolding by which it had been constructed. In this line the models I strove to imitate were Gibbon & Niebuhr. Of course you will not suppose for a moment that I mean to set myself up as anything like an equal to my great prototypes. I have endeavoured however to follow their example *quamvis non passibus æquis*. Still if I am not entirely blinded by partiality to my own performances I flatter myself that most competent judges will admit that few works in any Language contain so much recondite matter in a shape so available to the ordinary reader.

Having thus stated to you the general plan of my work I shall now, agreeably to your wishes, point out a few parts of it on which I bestowed a more than ordinary portion of artistic skill & labour. You, I am confident, will readily comprehend that the materials out of which the Preliminary Discourse was constructed were not collected, combined, & put into their present shape but at the expense of much time & elaboration. Although I am aware that you do not agree with me in all my opinions stated in the 1st Section I am persuaded you will admit that the character of Hippocratic medicine there given is both true & in a certain sense original. Is there any where so copious an outline of the contents of the whole Collection as is given in the 2d Section? I would also beg to draw your particular attention to the 3d Section wherein I have endeavoured to give a more correct exposition of the tenets held by the ancient philosophers on the Elements than I believe is to be met with elsewhere. Few can be better qualified than yourself to estimate the value of this section.

I am confident you will do me the justice to admit that the arguments prefixed to the various treatises bespeak not only a familiar acquaintance with the spirit of the original works but also an intimate knowledge of the Literature of the subjects. Those in the 1st Volume which I estimate highest are the arguments to "Regimen in Acute Diseases", "the Epidemics", & most especially the last wherein I have endeavoured to give the *cream* of all the best authorities have [*sic*] written on Injuries of the Head from Hippocrates down to our own days.

In the 2d Vol. the Arguments on "Fractures & Articulations" contain an exposition of my opinions on two subjects to which I have paid much attention. I expect it will be admitted that at p. 496, 500 & 504 I given a more correct description of the injuries which defall [*sic*] the Knee, the Elbow & the Ankle-joints than is to be found in any other work. In fact I lay claim to the merit of having been the first in modern times to rediscover the nature of the accident described at p. 501 as a rupture of the Trochlea of the Humerus.

What do you think of my Argument to & Commentary on the Aphorisms? Do they not shew that I have maturely weighed the opinions of a long list of Commentators from Apollonius & Galen down to Littré & Lefebvre & moreover that I exercise an independent judgment of my own in all important cases? In the Argument to the treatise on the Sacred Disease I endeavour to give an accurate statement of ancient opinions on two important questions connected with Physiology & Philosophy. But I must put a stop to this strain of self-laudation which however I know you will excuse as it was undertaken at your own request.

It occurs to me that as you are now employed upon my *Hipp.* you may feel interested in knowing the private opinions of our common friends Sir W. Hamilton & Dr. John Brown of Edinburgh as to the merits of the work. I inclose their Letters along with this.

Believe me always to be, My dear Sir,  
Most truly & affectionately yours  
Fr. Adams

Dr. Greenhill

PS. I omitted to call your attention to the remarks at p 565-569 on the knowledge of Human Anatomy possessed by Hippocrates.

## Hospital Service Department Notes

### The Second Session of the Canadian Hospital Council

Arrangements have been made for the second session of the Canadian Hospital Council to be held in Winnipeg on September 8th and 9th. It will be recalled that this national hospital organization was formally launched in September, 1931, when delegates representing hospital associations in all parts of Canada met in Toronto. At that time it was decided that the Council should meet approximately every two years and, despite the unusual conditions prevailing at the present time, this decision has been most enthusiastically confirmed. The Council is composed of delegates representing all of the twelve hospital associations in Canada, the federal and most of the provincial governments, and the department of hospital service of the Canadian Medical Association, which latter body has undertaken the secretarial work of the Council.

An interesting program is being arranged and it is anticipated that the September meeting will be the occasion of intensive discussion of many problems of vital concern to hospitals and their medical staffs. The various study-committees have been preparing reports and studies on many phases of hospital activities, and these will form a basis for discussion during the sessions. It is anticipated that hospital legislation and hospital finance will be given considerable prominence, in view of the increasing difficulties of the hospitals, and par-

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.

ticularly because of the unusual opportunity vouchsafed by this meeting in having brought together for the first time in Canadian history representatives of the various hospital associations and the federal and provincial governments; as a result, many matters of federal and inter-provincial concern can be satisfactorily discussed.

The relationship of the hospitals to the public and to the medical profession will receive considerable attention, particularly with respect to the establishment of clinics, preventive work, control of major surgery and other professional activities, group hospitalization on a voluntary basis or by municipal referendum, etc. Committees are now preparing studies of equipment, construction trends, operating theatre lighting, dietary service, physiotherapy developments and of various aspects of administrative problems. Psychopathic annexes and isolation wards are being studied and reported upon. A study is being made of tuberculosis in nurses, and a special committee of widely scattered workers is making a survey of the small hospitals in Canada, particularly with regard to their distribution, their efficiency, the best methods of financing them and their relationship to their committees and other institutions.

Attendance and participation in the discussions will not be limited to official delegates and it is hoped that many hospital workers, medical, lay and nursing, will plan to attend this meeting.

#### **The Heroism of Physicians and Nurses During The California Earthquake**

The Seaside Hospital at Long Beach was seriously damaged in the recent earthquake in California. The entire northwest wall was ripped away, exposing the operating and delivery rooms. At the time of the earthquake both were in use. The physicians and nurses continued their work of caring for the patients. A patient was giving birth to a baby girl when the wall fell, but the obstetrician and the delivery room attendants continued the work and the mother and child were saved. At the same time a delicate operation was being performed on a little boy, and the surgeon and the operating-room attendants pushed the operating table out of danger and completed the operation.

The nurses and staff worked rapidly to move the patients out of the old part of the hospital into the new building and succeeded in bringing all of them to safety, with only a few minor injuries. By the time the old wing was evacuated the victims injured in the earthquake were being brought to the hospital. The nursing and medical staffs worked under the difficulties of broken water pipes, interrupted

lights, and falling hospital walls. Many of them continued on duty uninterruptedly for from twenty-four to thirty-six hours in taking care of the injured. It was a remarkable example of the devotion of physicians and nurses to their patients in a time of the greatest dangers.—*Bull Am. Hosp. Ass.*

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### **Provincial Association Notes**

#### **The British Columbia Medical Association**

On July 3rd the annual meeting of the British Columbia Medical Association was held in Vancouver, following a most enjoyable dinner. The business dealt with was concerned mainly with amendments to the constitution made necessary by the recent reorganization. Dr. W. S. Turnbull, of Vancouver, was elected *President*.

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#### **The New Brunswick Medical Society**

The annual meeting of the New Brunswick Medical Society was held in Saint John on June 20th, at the same time as the meeting of the Canadian Medical Association.

The reports of the Registrar, Treasurer, and General Secretary were received and adopted without discussion.

The report of the special buffer committee which deals with controversial affairs arising out of the workings of the Workmen's Compensation Act was presented by Dr. R. A. Hughes. A very full report of the year's activities was generally discussed. This committee has done a tremendous amount of work in ordinary years, and in the year 1932-3 the depression necessitated a revision of the Workmen's Compensation schedule. A preliminary schedule was submitted by the Workmen's Compensation Board and was not acceptable to the profession in the province, and after some negotiation a compromise was reached whereby the old schedule was left in effect and all bills were taxed 15 per cent. This scheme still left points of controversy, and finally a meeting was arranged between the buffer committee and a committee of the Executive of the New Brunswick Legislature at which meeting the various points under discussion were satisfactorily cleared up. The thanks of the Society were extended to this buffer committee and the committee in its entirety was reappointed, viz., Drs. R. A. Hughes (Chairman), O. B. Evans and Jos. Tanzman.

A discussion of the motion *re* heroin, as passed by the Canadian Medical Association Council was postponed until next year.

A letter from Dr. T. C. Routley regarding medical relief was referred to the incoming executive.

A special vote of thanks was moved, seconded

and carried, to Dr. C. J. Veniot for his excellent work in the Executive of the Council of the Canadian Medical Association for the last five years.

The election of officers resulted as follows: *President*, Dr. P. H. LaPorte; *First Vice-President*, Dr. D. C. Malcolm; *Second Vice-President*, Dr. J. M. Barry; *Treasurer*, Dr. A. S. Kirkland; *Secretary*, Dr. R. M. Pendrigh.

Additional members of the Executive: Drs. A. F. VanWart, J. F. L. Brown, J. R. Nugent, A. Sormany, W. E. Gray, H. E. Britton, C. J. Veniot.

The following members were elected to the Canadian Medical Association Council: Drs. J. R. Nugent, J. M. Barry, G. C. VanWart, A. S. Kirkland, R. W. L. Earle.

The place of meeting for 1933 was left to the incoming executive for decision.

A. STANLEY KIRKLAND

## Medical Societies

### The Hamilton Academy of Medicine

At a recent meeting of the Hamilton Academy of Medicine, the following officers were elected: *President*, Dr. W. O. Stevenson; *First Vice-President*, Dr. Victor Ross; *Second Vice-President*, Dr. W. S. T. Connell; *Secretary*, Dr. William Bethune; and *Treasurer* Dr. H. W. Whytock.

### The New Brunswick Hospital Association

The annual meeting of the above Association was held in Saint John on June 22nd and 23rd, partly at St. Joseph's Hospital, and partly at the General Hospital. There were approximately seventy-five in attendance.

The program was particularly interesting, all the papers and demonstrations being well presented and discussed. In addition to those immediately concerned in hospital administration, papers were presented by Dr. A. S. Kirkland, Roentgenologist, Saint John General Hospital, "The place of the x-ray department in the hospital"; and by Dr. W. E. Rowley, Consultant of the General Hospital, on "The physician's duty to the hospital"; as well as Dr. W. O. McDonald, of Saint John, who spoke on "The operation of a diabetic clinic." The meeting was fortunate in having in attendance Dr. Malcolm T. MacEachern, Director of Hospital Activities of the American College of Surgeons, and Dr. G. Harvey Agnew, Secretary of the Canadian Hospital Council.

In addition to the presentation of papers, demonstrations and discussions of various aspects of hospital management were conducted by Doctors MacEachern and Agnew. These con-

cerned "Discussion of operating room management with demonstration of detailed procedure in handling major operations," "Authority and responsibility of supervisor," "Sterilization of surgical dressings, instruments, utensils and supplies," "Scrub-up technique," "Pre-anæsthetic examination," "Pre-operative examination," "Anæsthesia," "Records," which were very ably demonstrated by the staff of St. Joseph's Hospital, of which Sister Veronica is the Superintendent. Actual demonstration was presented by Sister Mona, Operating Room Supervisor, and was very ably portrayed. Demonstration and discussion on purchasing and issuing of supplies, with detailed explanation of the system and forms used, was made by Mr. R. H. Gale, Assistant Superintendent of the General Hospital, and the admission of patients, a very important matter, was presented under two headings: (a) "Admitting office procedure," Miss Josephine Dever, Admitting Officer, Saint John General Hospital; (b) "Business office procedure—handling of accounts—follow-up," Miss R. C. Wilson, Accountant, Moncton Hospital, Moncton, N.B. Mr. M. E. Agar, President of the Board of Commissioners of the General Hospital, gave an address on "The Governor: his duty to the hospital."

The Association was fortunate in having a paper by Mrs. R. N. M. Robertson, President of the Women's Hospital Aid in Saint John, on hospital aid work.

The paper delivered by Miss R. C. Wilson, accountant of the Moncton City Hospital, under the title of "Business office procedure," suggested four measures for the protection of the hospital, namely: hospital insurance; the creation of a provincial law making it a misdemeanour to defraud hospitals as now in the instance of hotels; the formation of inter-provincial regulations regarding the care of indigent accident cases; the education of the public to the realization of the necessity of giving hospitals adequate support. This paper received a tribute from Dr. Malcolm McEachern, under discussion.

Dr. W. E. Rowley, speaking under the title of the "Physician's duty to the hospital," stated his belief that the attending staff should have representation on the hospital governing body, chosen by themselves, from among themselves, and that it should be their privilege and duty to scrutinize all new candidates for appointment on the staff, and that the medical opinion should be given great weight when new appointments are being made. Another outstanding paragraph in Dr. Rowley's address advocated the payment of the staff for their services to the hospital.

The Association officers were re-elected for another term. The place of next year's meeting has not yet been decided, but will be chosen by the Executive in the course of the year.

At the conclusion of the meeting on Friday afternoon the delegates were guests, at tea, of the Board of Commissioners of the Saint John General Hospital, given for the visiting ladies attending the Canadian Medical Association meeting, which was also held in Saint John this year. The Convenors for the tea were Mrs. J. Verner McLellan, a member of the Board of Commissioners of this Hospital, and the Superintendent.

A. STANLEY KIRKLAND

### The Pacific Northwest Medical Association

The Pacific Northwest Medical Association opened its annual meeting in Vancouver, on July 4th, under the presidency of Dr. B. D. Gillies. An enrollment of 200, including members from as far away as Idaho, was regarded as very satisfactory. The speakers were Dr. A. T. Bazin, of Montreal; Dr. C. H. Best, of Toronto; Prof. Wm. Boyd, of Winnipeg; Dr. Donald Fraser, of Toronto; Dr. A. H. Gordon, of Montreal; Dr. A. T. Mathers, of Winnipeg; Dr. D. E. S. Wishart, of Toronto, and Dr. S. A. Kinnier Wilson, of London, Eng. Dr. J. G. FitzGerald, of the Connaught Laboratories, Toronto, who was to have been present, was called to Geneva, and Dr. Fraser kindly substituted for him.

### The Simcoe County Medical Association

The annual meeting of the Simcoe County Medical Association was held at the Royal Victoria Hospital, Barrie, on June 27th. A brief business session opened the meeting at which Dr. T. C. Routley, Secretary of the Ontario Medical Association, spoke briefly on the work of the Ontario Medical Association, as it affected the local society. Dr. John Graham of Bolton, the District Counsellor, also spoke, stressing the important rôle the district society is endeavouring to fulfill for the medical men.

The guest speakers were Dr. H. B. VanWyck, who gave an address on "Modern aids to labour," and Dr. F. W. Rolph who spoke on "Common disorders of the digestive system."

The following officers were elected for the ensuing year: *President*, Dr. F. M. Walker, Alliston; *First Vice-President*, Dr. W. C. Gilchrist, Orillia; *Second Vice-President*, Dr. T. J. Simpson, Collingwood; *Third Vice-President*, Dr. D. C. S. Swan, Midland; *Secretary-Treasurer*, Dr. A. H. Pinchin, Midland.

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OF POTATOES.—*Clusius* calleth the *Spanish Potatoes*, which are those in most request now amongst us, *Battata* and *Battatas Virginiana sive Virginianorum*, *Papas*, *Papus* and *Pappus*. Those of Canada which we in English call *Jerusalem Artichocks*, because the Root being boyled is in taste like the bottom of an *Artichock*, are called by *Pelleterius*, *Heliotropium Indicum tuberosum*; by *Columna*, *Flos Solis Farnesianus*, sive *Aster Peruvianus tuberosus*.—Wm. Coles, in "Adam in Eden, or Nature's Paradise," 1657, Chap. CCLXIX, p. 33.

## Special Correspondence

### The London Letter

(From our own correspondent)

The problems for the medical profession caused by the motor car seem as far from solution as ever. It has been emphasized in these notes more than once that in England the number of people killed daily in motor accidents is such that if an unusual epidemic were sweeping these islands with a similar death roll there would be unbounded activity by the authorities until the scourge had been mastered. With this motor business, however, there is a curious element of complacency; another aspect of the problem perhaps also illustrates a possible reason for the attitude of the powers-that-be in so far as doctors are being increasingly called upon to treat the persons involved in road accidents without any fee or return for their services while it is estimated that the hospitals in England are treating casualties from the roads at a cost of about £230,000 per year of which only about a tenth can be recovered under existing legislation. Since the motorist, as a rule, either will not or cannot pay such expenses (and the former alternative is strongly supported by the statistics) it is being urged that the law must extend the present insurance schemes so that for a small annual premium the cost of any treatment required will be paid by the insurance company to the doctor or hospital involved. Lord Moynihan is introducing a Bill with this object in the House of Lords and this should certainly improve the present position. But it still leaves the central problem of the toll of the roads unsolved and if, as is suggested above, there is a streak of selfishness in the average motorist, then the effective reduction of road fatalities is a matter of moral education and the sooner it is begun on a national scale the better.

The Royal Institute of Public Health has been visiting Eastbourne for its annual meeting and various important subjects have been discussed. Lord Leverhulme gave his presidential address on sickness in industry, stressing the need for very close cooperation between industrial leaders and the medical profession to reduce the absenteeism due, for the most part, to influenza and the common cold and amounting to an average of nearly a fortnight every year for each insured person. One of the most important discussions of the meeting centred round the relation between soil and climate and the rheumatic group of disorders. This is believed to be the first time that medical men and meteorologists have taken part in a joint discussion. It seemed to be agreed that whatever part cold and damp might play in the production of rheumatism their rôle was certainly not primary. An interesting point brought out by several speakers

was the fact that nowadays each individual lives in a "micro-climate" of his or her own making, since clothing and bed-clothes modify greatly the climate provided by Nature. The general verdict against climatic factors was certainly "not proven" even if not an emphatic "not guilty". Thus the problem of rheumatism remains as deep a mystery as ever and the British Medical Association, recognizing the importance of the subject, two years ago, also at Eastbourne, appointed a committee to survey the present state of our knowledge and indicate lines for further research and professional education. This committee has now reported and its report deals with chronic arthritis excluding those forms whose causation is reasonably clear. Beginning with a bold attempt at settling the difficult nomenclature the report goes on to deal with many aspects of the subject, disclosing serious gaps in our knowledge and suggesting schemes for treatment on a national scale. In three respects especially are the findings valuable. There is a strongly worded condemnation of the way in which quack remedies are used to exploit the rheumatic sufferer; there is a highly satisfactory statement on diet which gets rid of many old-fashioned restrictions; and there is a full section on orthopaedic and surgical treatment which indicates a method of assistance by no means fully made use of by the chronic cripple.

The death of Sir Walter Fletcher, secretary of the Medical Research Council, has been a great shock to the profession in this country. He had been the chief executive officer of this body from its formation and coming from a career at Cambridge, where he had not only been a great sportsman and a "don" but had also carried out research work which gained the F.R.S., Fletcher showed that he was possessed of great organizing ability. Despite the outbreak of war shortly after he took up his duties, the end of hostilities found a valuable body already established and under its new constitution the Medical Research Council began to guide and sponsor research work in this country which was of a character and high standard that has been a revelation to many. That this was largely due to Fletcher's skilful leadership no one will deny, and for this reason alone, to say nothing of his charming personality, intense enthusiasm and sterling straight-forwardness, he will be very greatly missed.

ALAN MONCRIEFF.

London.

### **The Edinburgh Letter**

*(From our own correspondent)*

Under the regulations of the National Health Insurance Acts practitioners in Scotland are required to keep such records as the Department of Health may determine. Up till two years ago the required records were of a purely

statistical character. As these were found to be of very little value the advisability of instituting a clinical form of record was considered. After discussions between the medical officers of the Department of Health and the Insurance Acts Sub-Committee for Scotland—a Committee set up by the British Medical Association as the responsible negotiating body in Scotland—it was decided to inaugurate a system of clinical records. The first of these records was an enquiry into the early symptoms of heart disease. An interim report of the results obtained from this enquiry has been issued and it is expected that when the final report is available the usefulness of such clinical records will be demonstrated. The next record to be instituted in July of this year will be an investigation into valvular disease of the heart with special reference to therapy. The form provided for this purpose has been drawn up with the object of correlating, if possible, the symptoms and physical signs of the valvular lesion with the treatment prescribed. It is felt that the knowledge and experience of the general practitioners of the country in such matters should provide useful information which cannot otherwise be readily obtained.

The importance is being recognized of ensuring that unemployed persons should be kept in a state of physical fitness so as enable them to enter employment again when the opportunity offers. With a view to stimulating interest in this matter the Glasgow Council for Community Service in Unemployment is organizing a "Keep Fit" week to be held in September. The program will draw public attention to the facilities provided towards the desired end. Each afternoon and evening during the week addresses will be delivered at various centres by prominent sporting personalities, and displays of various athletic activities will be given. During the holding of the displays, it is intended to distribute leaflets showing the unemployment centre in the various areas to which men and women can report if they wish to receive physical instruction. The present program includes displays of physical culture, gymnastics, boxing and ju-jitsu, while it is hoped that it will be possible to hold a river pageant on the Clyde and also a cyclists' rally.

Edinburgh has been known to generations of her sons and daughters by the affectionate, if somewhat doubtful, title of "Auld Reekie", due to the smoke which so frequently overhung the City. Of recent years, however, an improvement in this respect has been brought about by the use of gas and electricity for heating and cooking. This fact was emphasized at the recent annual meeting of the Scottish Branch of the National Smoke Abatement Society which was recently held in the City. It was stated that these newer methods had supplanted the direct burning of thousands of tons of coal and that

there was now less pollution of the atmosphere by smoke than in most cities of similar size. Professor William Oliver, of Edinburgh University, said that while much had been accomplished, complete smoke abatement was very far from attainment, and the problem of domestic smoke diminution depended primarily upon the use of smokeless fuel such as coke, together with an increasing use of gas and electricity. The ideal system would be one in which all raw coal was treated by low-temperature carbonization, and the gas thus obtained used for boiler firing, while the oil, tar, and other by-products were employed to reduce imports of these commodities, and the coke used for domestic purposes. In view of the importance of sunshine in relation to resistance to lung infection it is to be hoped that the efforts of the society to secure a clearer atmosphere will bring about the desired result.

An important step has been taken by the Secretary of State for Scotland in the setting up of a special committee to hold an inquiry into the medical services of the country. It is recognized that these services have grown up in a more or less haphazard way without the necessary co-ordination and without a unified purpose. A previous Departmental Committee recommended that such an inquiry should be held to review the health services from the social, health, financial and administrative points of view. It is intended that the inquiry should be a fundamental one and the whole question of the health policy of the country will come under review. The Committee will take at least two years to complete its work and its recommendations may have far-reaching effects on the future of medical practice and national health organization in Scotland. The Committee consists of eighteen members. The Chairman is Sir John Dove-Wilson, K.C., M.A., LL.B., ex-President of the Supreme Court of Natal, and in view of the comprehensive nature of its work the members consist of experienced administrators as well as medical experts. The reference to the Committee is as follows:—

To review the existing health services of Scotland in the light of modern conditions and knowledge and to make recommendations on any changes in policy and organization that may be considered necessary for the promotion of efficiency and economy.

R. W. CRAIG.

Edinburgh.

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Who despises an insignificant enemy resembles him who is careless about fire. Extinguish it to-day while it may be quenched, because when fire is high it burns the world. Allow not the bow to be drawn by a foe, for an arrow may pierce thee.—*Maxim XII* of the Sheik Sa'di of Shiraz.

## Letters, Notes and Queries

### Qualifications of Specialists

*To the Editor:*

The article by E. Stanley Ryerson on "The Qualification of Specialists in Canada" is indeed a timely one—I understand New Jersey is trying some such scheme now. Only one fault would I find with the writer's suggestions—why should an F.R.C.S. entitle one to a specialist's diploma in say, eye, ear, nose and throat, or why should an honorary F.R.C.S.(C.) entitle one to a specialist's diploma even in surgery—many honorary F.R.C.S.(C.) degrees it would seem were given out through circumstances rather than because of training or special ability. No; there should only be one road and that is via exam. or qualified hospital residencies.

W. H. M. THOMSON, M.D.

London, Ont.,

July 7, 1933.

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### Cancer and Nursing

*To the Editor:*

The following history, I thought might be interesting and worth publishing.

Mrs. T., aged 52, is suffering from a cancer of the body of the uterus. The history goes back to a Mrs. H., an aunt by marriage of Mrs. T., who nursed in London a patient who died of carcinoma of the stomach. This nurse died of cancer of the stomach in 1907, aged 70 years. Her nurse was a niece. She died of cancer of gall bladder in 1927, aged 56. An elder sister who took care of her died of cancer of the stomach in 1932, aged 72. These last three all lived in the same house in a suburb of London, England. My patient, who has cancer of uterus nursed the last case at her home in London for some months before she died.

H. A. GIBSON.

Calgary, Alta.,

June 6, 1933.

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

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Tread softly and circumspectly in this funambulatory Track and narrow Path of Goodness: pursue Virtue virtuously: leaven not good actions nor render Virtues disputable. Stain not fair acts with foul Intentions: Maim not Uprightness by halting Concomitances, nor circumstantially deprave substantial Goodness.—Sir Thomas Browne.

## Topics of Current Interest

### Tuberculosis Research at the University of Toronto during 1931-32

During the year under review an investigation has been continued on the types of tubercle bacilli in human tuberculosis and on the influence of silica upon the growth of tubercle bacilli. There has also been carried out a study of the possible relation of tuberculosis to Hodgkin's disease.

Four hundred and thirty-six cases of clinical tuberculosis were investigated with a view to ascertaining the types of the infecting organism. In this series of cases, 268 were children under 14 years of age, and 168 adults, 15 years and over. Both medical and surgical cases were studied. In the juvenile group, 230 patients proved to be infected with the human type, and 38, or 14.1 per cent, with the bovine type of tubercle bacillus. In the adult group 6, or 3.5 per cent, proved to be infected with the bovine type, the remaining 162 cases with the human type of tubercle bacillus.

Of particular interest among the new cases of bovine tuberculosis encountered are three from Kirkland Lake, Ontario. Two of these came to Toronto prior to the outbreak of the epidemic of septic sore throat in that community, while the third case appeared shortly following the epidemic. In the latter part of December, 1930, there occurred in Kirkland Lake a severe outbreak of septic sore throat, the source of which was finally traced to one dairy. Seven head of cattle from the infected dairy were slaughtered, and although these animals were presumably tuberculin-negative and belonged to an accredited herd, one of the seven animals was so grossly infected with tuberculosis that the carcass was condemned. Subsequent to this epidemic the sale of raw milk was prohibited and a compulsory pasteurization by-law was passed.

The effective pasteurization of milk appears to be the only solution for the prevention of bovine infection. Pasteurization, however, can be considered safe only when carried out under rigid control. The excellent results obtained in Toronto from the standpoint of the eradication of bovine tuberculosis are attributable mainly to the efficient pasteurization of milk, and afford an effective demonstration of the control of bovine tuberculosis in man.

Preliminary results of an investigation on the influence of silica on the growth of the tubercle bacillus were published in the fourteenth annual report. These results have now been further confirmed. The effect of silica appears to be roughly in proportion to the solubility of the compound containing it. Thus, it has been found that the addition of small amounts of

sodium silicate causes the greatest stimulation and quartz suspensions the least.

The cause of Hodgkin's disease is obscure. Clinically this common and fatal disease appears more like an infectious process than a primary disease of the blood-forming organs, while the gross character suggests the presence of an invasive tumour. Some have considered it an atypical form of avian tuberculosis. Five cases of clinically and histologically typical cases of this disease were investigated with a view to determining any possible association with avian tubercle bacilli. In each case a lymph gland was removed by an operation and was inoculated into fowls, and also into rabbits, which are extremely susceptible to avian tuberculosis, usually dying within three weeks of a generalized infection. In no case did avian tuberculosis develop. In the case of two guinea pigs inoculated in the same way tuberculosis of a human type was contracted.—Epitome in Fifteenth Annual Report of the National Research Council, Ottawa, 1931-32.

### Tuberculosis Research at the University of Montreal during 1931-32

The chief work of the Montreal group (under the direction of Prof. J. A. Baudouin) has been the vaccination of babies with BCG and the careful observation of both the vaccinated children and a large number of controls. The number of children vaccinated during 1931 is 285, bringing the total vaccinated children to 2,166. The distribution of BCG has been made through the School of Public Health Nursing of the University of Montreal.

The present report covers the detailed record of 741 children, of whom 341 were vaccinated and 400 were unvaccinated controls. Both the mortality and morbidity of the two groups have been studied.

The general mortality of the vaccinated children during a period of four years has been 117 per thousand against 140 for the controls, a difference in favour of the vaccinated children of 16 per cent. The mortality from tuberculosis of those in contact with positive sputum cases was 63 per cent less in the case of those vaccinated. In a group of 33 vaccinated babies from one to twelve months old in contact with positive sputum cases the deaths from tuberculosis were 92 per cent less than in the unvaccinated controls. The morbidity of the vaccinated children is also considerably less than that of the controls, particularly in respect to tuberculosis, where the margin is 84 per cent in favour of the vaccinated children. These figures indicate that a very appreciable protection of children against tuberculosis is conferred by vaccination with BCG.

Further, the innocuity of BCG is regarded as

fully established, no untoward effect having been observed from the vaccination of 2,166 children who have been under observation over a period of five years. The innocuity of BCG has been confirmed by the repeated inoculation of massive doses of BCG into guinea pigs, which are still alive and well after having been kept under close observation over a long period of time.—Epitome in Fifteenth Annual Report of the National Research Council, Ottawa, 1931-32.

### Poisonous Gases

Although research on the development of chemical warfare is necessarily conducted *sub rosa*, the same secrecy does not apply to its preventive and curative aspects. The United States have been especially active in this respect and A. R. Koontz's account of the work done by the medical research division of the United States Chemical Warfare Service is of value not only from a medico-military point of view but also because of the light it may throw on gas poisoning in civil life and industry. Thus it was found that the so-called chemical pneumonia of industrial workers, which has long been recognized as having a typical pathological picture (the alveoli being filled with desquamated epithelial cells and large mononuclears, with very little fibrin and few or no leucocytes), is not solely due to chemical irritation; indeed, bacteria are present in only slightly smaller numbers than in the ordinary type. A condition resembling chemical pneumonia was seen in animals which had never been exposed to irritating vapours, and attention is drawn to the similarity between the pathology of this type of pneumonia and that found in psittacosis. In the treatment of phosgene poisoning German workers had suggested that double section of the vagus nerves prevented the onset of oedema. By animal experiment Vedder and Sawyer claim to have refuted this statement and they further believe that they have made a considerable advance in treatment by the injection of urease which is supposed by the production of ammonia to neutralize the hydrochloric acid produced in the tissues by the hydrolysis of phosgene. Intravenous gum-glucose solution and the injection of emetine to reduce pulmonary congestion increased the beneficial effects. Walton and Eldridge found by human experiment that chlorine would rapidly cure poisoning by the toxic smokes of the diphenylarsine group by converting the arsenic from the trivalent to the pentavalent form and producing a non-irritating product. The same workers claim to have shown that in cases of monoxide poisoning the elimination of CO was hardly less in treatment with oxygen plus carbon dioxide than with oxygen alone; they therefore recommend that for simplicity pure oxygen should be used. On the vexed question of the after-effects of war gases,

and their relation to tuberculosis in particular, experiments on more than 300 dogs showed almost negligible pathological changes in the lungs after sub-lethal doses of phosgene, lewisite, chlorine, chloropicrin, and methylchlorarsine. A similar number of rabbits were injected with large doses of tubercle bacilli and half of them were gassed; yet those which were gassed showed no greater incidence of tuberculosis. With mustard-gas, indeed, when very small doses of tubercle bacilli were used, gassing seemed actually to have an inhibitory effect, and it is suggested that congestion of the lungs is unfavourable to the growth of the tubercle bacillus—as has previously been stated in connection with mitral stenosis.

Finally, a full investigation by the Chemical Warfare Service of the Cleveland x-ray film disaster produced some interesting conclusions. It was found that when x-ray films are ignited in a closed space a flameless type of combustion may go on for a long time, and finally on the addition of oxygen, as by the opening of a door, the whole mass may burst into flame or even explode. The burning of films may be caused by merely heating the film—e.g., with an electric light bulb, a hot steam pipe, or any source of heat which will raise the temperature of the film above 100° C. The gases produced (in the absence of adequate supplies of oxygen) are chiefly carbon monoxide and nitrous oxides.—*The Lancet*, 1933, 1: 978.

### New Forms of Medical Practice

Previous to the onset of the present economic depression numerous experiments in changing the nature and methods of medical practice had been evolved and were in operation. In foreign countries panel systems, *krankenkassen*, and other forms of state medicine had been introduced. In our own country such modifications in medical practice as the group, the university clinic, the cooperative laboratory, the hospital as a centre, and similar organizations and institutions had begun to have their effect on medical practice and on public opinion in relation thereto. Moreover, agitation and propaganda were stimulating new efforts in this direction, presumably always with altruistic motives. Then came the "crash." It acted like a ferment in stimulating new ventures which promised either definite or large returns to physicians who would permit indirect marketing of their services.

Elsewhere in this issue appears a brief outline concerning two corporations established to sell the services of physicians to the public on a large scale. The records of those interested in the promotion indicate that these schemes are not to be taken lightly. If the statements in the charters are to be accepted as anything more than legal verbiage and promotional license, it is

proposed to operate these corporations on a national scale and, by such operation, to disrupt seriously established forms of medical practice and the stability of medical organizations. It is rumoured, and for the rumour there is more than a modicum of evidence, that a considerable number of physicians have already indicated their willingness to participate in this scheme.

The ideals of established medicine in this country have been clearly stated again and again. Opposed to those ideals are attempts to commercialize medical practice through exploitation of the services of physicians by corporations which consider medical ethics merely a hindrance. Such corporations do not hesitate to evade the obstruction, soliciting patients by newspaper publicity, the radio and other methods of indirect advertising and also by direct announcements in the press.

Some of the leaders in the field of social service whose experience should have taught them better do not hesitate to encourage these promoters in their plans. The scheme proposed by J. G. Berkowitz and his associates has a tacit endorsement in the public and printed utterances of E. A. Filene and of Michael M. Davis. Notwithstanding any of the arguments that may be offered in support of such plans, they strike at the very basis of sound medical practice, they will interfere seriously with the advancement of medical science and they will hasten, if not precipitate, the coming of government schemes of medical practice.

The physicians who have considered seriously the acceptance of full-time salaried positions with corporations of business men who propose to exploit such service for profit may consider well what happens when economic stress, personal relationships, differences of opinion as to scientific methods, or similar complications necessitate separation of the employed from the employer. The employer of the physician in private practice is his patient. In times of stress these patients may not be able to pay him as much as previously, perhaps not at all. During the present emergency most physicians are continuing to care for their patients and are waiting patiently for the period when a return of prosperity will permit the settling of debts. These physicians still have their practices. The physician employed by a corporation has no practice of his own. The patients are not his patients—they are the patients of the clinic, institute, group or other corporation that employed him. When he severs his connection with his employer, for any of the reasons that have been mentioned, he must remove most frequently to another community, there to begin as he might have begun years before, to develop the relationships with individual patients that have been the very basis of medical practice since the beginning of time. And what of the patient? In the clinic, institute or group lies the record

of his medical care, but such a record is far removed from the human understanding that is fundamental between patient and physician. Michael Davis cites as one of the qualities which patients may rightly expect in medical service "a sense of personal responsibility for each patient on the part of the physician and a sense of individual attention from the physician on the part of each patient." Is there the slightest reason to believe that any corporation of business men vending medical service through salaried physicians will ever be able to meet this expectation?

It has been for years the policy of the American Medical Association that the interest of the public is first. The Journal opposes such schemes not only because they are bad medical practice but also because they must inevitably result in an inferior type of medical practice for the people of this country.

The laws of the state of Delaware and of Illinois are quite clear in opposing the practice of law or of medicine by corporations. The suitable committees of the state medical societies in these states may well consider carefully whether or not it is advisable to set in motion at once the necessary legal machinery to oppose the establishment of such corporations as being directly opposed to the laws of the state.—*J. Am. M. Ass.*, 1932, 99: 1264.

#### The Social Aspect of Bed-Wetting

It was many years ago that Ernst von Düring was led to remark "Many tramps are bed-wetters, but not because they are tramps: they are tramps because they wet their beds"; and he called pointed attention to the severe social and economic damage undergone by those who suffer from enuresis. No one knows exactly what is the proportion of this failing among the population at large. Among Kent school-children inquiry suggested that there were rather more than 1 per cent who wet their beds at night, but Dr. W. H. de B. Hubert, in an article which appeared in our last issue (p. 1281), spoke of 8 to 10 per cent among an unselected group of children from L.C.C. residential schools. Dr. Friedrich Dietel, first assistant in the Erlangen dermatological clinic, who wrote a monograph on enuresis a few years ago made no attempt to estimate the proportion but remarked that not infrequently the enuretic children showed a certain inferiority of constitution; they were as a rule definitely behind their contemporaries in some respects, learning to stand, to walk, and to speak later than other children, and definitely later in getting control over bladder and rectum. He and others would have expected to find enuresis definitely more frequent in the lower social grades and especially in places where tramps congregate and in penal institutions. But that is not so, according to careful inquiries

made by the late Dr. Ethel Bentham in the London casual wards. Dr. Bentham however was of opinion that enuresis was often a primary cause of women falling out of decent occupations. She knew herself of many young maid-servants who lost their jobs because of this infirmity, and she mentioned at the time the head of a big institution in Amsterdam who attached so much importance to this factor in social inferiority that if any boy or lad, who came in, showed any tendency to it he was put through a special course of three week's treatment to cure him of it, generally with success. It may of course be true that to some extent enuresis and the *wanderlust* have a common source. Two books reviewed in a recent issue (May 6th, p. 969) throw some light on this. Dr. H. C. Cameron, one of the few pædiatricians who has given the matter the attention it deserves, regards enuresis as hysterical in nature, aggravated by fatigue and acidosis and by the unhappiness which it engenders. Dr. R. J. Batty, from study of Lancashire children, attributes enuresis largely to bad economic and hygienic conditions. Dr. Hubert however found that the intelligence of the children sent to the Maudsley Hospital for enuresis was very similar to that of children referred for other reasons. In 24 per cent of them there was a marked anxiety state of behaviour or disorder. He did however find rather strong evidence of heredity, 40 per cent of the children referred for treatment having had parent, uncle, or aunt who suffered similarly when children. Common ground of all these clinicians, from whatever aspect they studied bed-wetting, is the conviction that in enuresis we have not to deal with an incurable condition, however troublesome and intractable it may be. Patient persistence with the appropriate treatment will often eventually bring success.—*The Lancet*, 1933, 1: 1357.

#### Principles for Practical Propaganda

Like democracy, Wm. W. Biddle observes in the *Journal of Abnormal and Social Psychology*, propaganda is dependent upon widespread literacy and rapid social communication, the telephone, the press, the radio, the motion picture. Many forms of coercion create emotional disturbance in the coerced, resentments, over-compensations, or desires for revolt. Propaganda is different in that it controls without occasioning antagonistic emotions. Each individual behaves as though his response were his own decision. Many individuals may be coerced to behave alike, each apparently guided by his independent judgment.

Education has as one of its major interests the development of rational or conscious control over conduct. Instead of acting instinctively or according to habit the truly educated person takes time to consider the problem.

The aim of propaganda is to prevent thinking and promote emotion. It uses emotionally toned phrases which provoke impulsive action and are repeatable. Propaganda as practised to-day is a process of indirect emotional conditioning on a large scale.

For practical propaganda, Dr. Knight Dunlap, Johns Hopkins professor of psychology, gives a list of principles:

- (a) Repeat systematically and incessantly.
- (b) Avoid argument, never admit there is another side; reserve argument for intellectuals.
- (c) Connect the desired idea with the known wishes of the audience.
- (d) Make statements in clear repeatable form.
- (e) Use direct statements sparingly; use indirection, innuendo, implication. Use direct statement in such a way that the audience will take it in but not reflect upon it.
- (f) For permanent results, aim propaganda at the children.

They are repeated here in the hope that they will be useful in defending the helpless everyday mortal from the menace of propaganda.—*Science News Letter*, October 22, 1932.

## Abstracts from Current Literature

### Medicine

**The rôle of Bacteria in Allergy, with Special Reference to Asthma.** Benson, R. L., *Ann. of Int. Med.*, 1932, 6: 1136.

Positive dermal reactions to foods and dusts do not preclude a coexisting bacterial sensitization. This sensitization is a specific effect of the pathogenic microorganisms, and is to be distinguished from the non-specific irritation of vagus-nerve endings and of bronchial musculature directly by bacterial infection present in the bronchial tree. The author refers to the work of Vaughan, Avery, Dochez, Zinsser, Parker, Sabin, Enders and others, whose findings suggest that bacteria contain an indefinite variety of specific protein compounds which are capable of acting as antigens. Sensitization to bacterial antigens cannot be produced with the same ease and certainty as that to horse serum and egg white. This is probably because the coagulable protein present in the bacterial bodies is relatively small in amount. The development of hypersensitiveness to bacteria is usually dependent upon the presence in the organism of whole bacteria, and appears to be related to the nucleo-protein carbohydrate combination.

The author groups his asthma cases into (a) non-bacterial, (b) bacterial, and (c) mixed. As a routine, he tests the dermal reactions to foods and dusts with which the patient comes in contact, and cultures the sputum and faeces.

Curschmann's spirals are washed in sterile saline, ground in a mortar with sterile sand, and cultured with the addition to the medium of the patient's blood or serum. Culture of the faeces is carried out according to a rigid technique which inhibits the growth of intestinal Gram-negative organisms. By this method the normal individual and the non-bacterial sensitization case usually give a negative or negligible culture, while the subject with bacterial allergy will in the majority of instances give a growth of pathogenic bacteria ranging from 100,000 to many millions from each loopful of stool plated out. In order of frequency, the organisms encountered are *S. viridans*, *S. hæmolyticus*, *S. non-hæmolyticus* and *Staph. aureus*.

The requisites for success in vaccine treatment are proper choice of foci for culturing, careful isolation of the predominating organism, standardization of dosage by cutaneous tests and systemic reaction, and the employment of the type of preparation which includes the specific causes of the asthma. The vaccines employed by the author usually include both heat-killed bacteria and unheated filtrate. The choice of the particular cultures which enter into the vaccine is made on the basis of cutaneous reactions, and a trial dosage is worked out on the basis of the sensitiveness manifested by the skin. As a general rule, the immediate wheal and its surrounding erythema are of non-specific protein origin, the specific response occurring at the site of inoculation in ten, fifteen or twenty-four hours. By starting with a minute dose, it is generally possible to desensitize the individual to bacterial antigens.

The author cites several typical cases to show the value and possibilities of properly conducted vaccine therapy in bacteria-sensitive individuals. The results of his treatment in the bacteria-sensitive group are every bit as good as in the food and dust sensitive group of cases.

H. GODFREY BIRD

**Discussion on the Pathogeny of Nephritis and its Bearing on Treatment.** de Wesselow, O. L. V., *Proc. Royal Soc. Med.*, 1932, 26: 289 (section medicine).

The pathogenesis of acute and chronic glomerulonephritis and of focal nephritis is discussed. Acute glomerulonephritis is the result of infection, which may be almost anywhere in the body but most commonly in the upper respiratory tract. In epidemic war nephritis, an infective focus was seldom found; perhaps too little attention was paid to minor skin infections. The causal organism is usually a streptococcus; throat swabs taken after nephritic symptoms develop are of little value, since the flora may have changed completely in the 2 or 3 weeks after infection. The author and others are at present investigating tonsillitis cases at St. Thomas's Hospital. All cases

are being followed for 18 to 20 days, throat swabs being taken early, to gauge the degree of infestation with hæmolytic streptococci, and later three examinations of the morning urine for pus and casts and three blood pressure observations, are made. Of 49 patients seen in July and August, 12 per cent were heavily infected with streptococci; of 51 cases in September, 26 per cent; and of 34 cases in October, 35 per cent. Those showing albuminuria on the 12th or 19th day after infection, were, August, 6 per cent; September 16 per cent; October, 28 per cent. There is, however, no connection between predominating hæmolytic streptococcus infection and subsequent albuminuria and hence at present no data to incriminate the hæmolytic streptococcus rather than other organisms. No case of microscopic hæmaturia or of oedema has been seen to date. Except that the albuminuric children are pale and listless and their appetites are poor, there is nothing suggestive of nephritis. In the 34 tonsillitis cases seen in October, 10 had heavy albuminuria, and 6, epithelial casts. None of these would have come under medical observation, except for the fact of the routine examinations. From such individuals are recruited the large group of cases in which evidence of chronic glomerulonephritis is found without history of an acute attack.

Cold appears to be the most obvious factor determining the development of renal damage in an individual. It may be that the winter prevalence of the disease is explained by this rather than by the prevalence of any particular infection at this time. It has recently been pointed out that the circulation in the kidneys and in the skin runs parallel, and cooling of the skin results in vasoconstriction. The essential feature of the renal lesion is the glomerular ischæmia. The author believes, with Volhard, that this is due to an active contraction of the vasa afferentia, rather than a swelling of the glomerular capillary endothelium (Fahr). It is known that the characteristic blood pressure rise of acute glomerulonephritis occurs before albuminuria. The sudden restoration of function, the diuresis and rapid disappearance of albumin seems most consistent with a vascular spasm theory.

The prognosis of the condition is very favourable, 75 per cent recovering in the first and a further 20 per cent in the second year (Addis). After two years' albuminuria, the lesion may be regarded as irreparable; the course is most variable. Subacute cases end fatally within a few months; there is a chronic type in whom all the signs persist, who die in a couple of years; finally, there is a large group in which albuminuria and casts alone persist. Some of these patients survive as long as 40 or 50 years before renal inadequacy supervenes. Prevention is the first aim in treatment. There is

general agreement on the importance of shielding scarlet fever patients from cold and exposure. The earlier a case of nephritis comes under treatment, the better the prognosis. The author advises that all tonsillitis patients be examined at least once during convalescence and that they be confined to bed if albuminuria is found. Infective foci should be looked for and if found removed or treated; the stage of remission from acute symptoms is the time to remove tonsils if these are involved. The results from removal of foci in chronic cases are difficult to assess.

W. FORD CONNELL

**The Patch Test in the Diagnosis of Contact Dermatitis.** Ayres, S. and Anderson, N. P., *Ann. of Int. Med.*, 1932, 6: 1161.

As there is no fundamental difference, either histologically or in most cases clinically, between an eczema of internal origin and a dermatitis due to external irritation, a simple and reliable test for the latter is of the utmost importance. The situation of the rash may be of no help in making the diagnosis, as an eruption due to an internal cause and aggravated by exposure to the sun, may first appear on uncovered portions of the body, and, on the other hand, one caused by an external irritant may spread over large areas far removed from point of contact.

The authors report their findings in 24 cases of eczematoïd dermatitis in which the etiology was established by the patch test. They found this method of testing superior to the so-called scratch test, which, although very useful in cases of food-sensitization and in some instances of eczema due to contact with animal hair or pollen, sometimes gave a negative test with a pollen when the patch test was strongly positive.

All possible irritants in the patient's environment are first carefully considered, and such substances, whether protein or non-protein, are used in the test. Every effort should be made to simulate the original conditions under which the irritation took place, chemicals being used in the strength originally encountered, leaves of plants being as fresh as possible, dry powders moistened, etc. Each substance is placed on a small square of cotton about the size of a postage stamp, which is then applied to the flexor surface of the forearm. This is covered with a square of cellophane about four times as large, held in place with wide strips of adhesive plaster. The patch is allowed to remain in place undisturbed for twenty-four hours. A positive test is characterized by a sharply defined square of redness corresponding in size and shape to the central area. Papules and vesicles are usually present, corresponding to the appearance of the original eruption.

H. GODFREY BIRD

## Surgery

**Intermuscular Abscesses.** Phillips, H. A., *Brit. M. J.*, 1933, 1: 223.

Two types are described: (1) those of known etiology, and (2) the idiopathic. The former include suppuration in hæmatomata, in an intermuscular bursa around a foreign body, and in lymphatic glands.

Hæmatomata may be the result of direct violence, more commonly due to complete or partial rupture of a muscle. The addition of a low-grade infection converts these into abscesses. Such abscesses have been noted in the extremities, in relation to the serratus anticus, the rectus and the obliquus internus, and in the ham-strings.

Pyæmic intermuscular abscesses are usually multiple. These are relatively painless, and their spread insidious. Abscesses about foreign bodies are usually self-evident. Subpectoral abscesses form an example of the lymphatic type.

Intermuscular tuberculous abscesses are rare. A large number of single intermuscular abscesses are idiopathic. They probably are the result of emboli from some focus of infection. The commonest site is the thigh. They have also been noticed in the flexor muscles of the arm, the glutei, the rectus abdominis and the infra-spinatus.

The commonest symptom is pain, deep seated, rather acute in onset, occasionally cramp-like at first, later throbbing. Pain is increased on motion. Varying degrees of anorexia and malaise result. The pulse is rapid and the temperature high. Extreme tenderness on deep pressure over a fairly wide area is present. The limb becomes larger. Redness and œdema develop when the abscess points.

Osteomyelitis, sarcoma, and "rheumatism" are the usual diagnoses made in these cases.

Pus is obtained by aspiration, the needle left in place, and an incision is carried down along it to evacuate the abscess. The commonest organism found is the *S. aureus*.

STUART GORDON

**Splenectomy in the Treatment of Hæmorrhagic Purpura.** Askey, J. M. and Toland, C. G., *Arch. Surg.*, 1933, 26: 103.

The chief characteristic of thrombocytopenic purpura hæmorrhagica is the occurrence of pathological hæmorrhage, varying from a massive loss in the acute form, usually with a rapid termination, to the milder form lasting for years. The blood platelets show marked reduction. Until recently splenectomy was considered futile in the fulminating type, but several authors have reported recoveries following this procedure. In the majority of cases of the chronic form splenectomy has proved successful. Current opinion holds that the spleen is abnormally destructive to platelets, so that thrombocytopenia and its sequelæ are pro-

duced. The whole reticuloendothelial system is diseased and the spleen exerts the greatest influence. The authors report the case history of a female, 36 years old, who since the age of 14 evidenced purpuric manifestations of the type under discussion. Following splenectomy the rather typical response of the blood picture occurred, with a marked leukocytosis which slowly decreased. There was a considerable rise in platelets. The patient gained in weight and strength and resumed her occupation. A year after the operation there was a clinical cure, but only a moderate improvement in the blood picture. The effect of splenectomy in this disease is more complex and far-reaching than it has yet been possible to explain by the elevation of the platelets.

G. E. LEARMONTH

**Sacrococcygeal Teratomas.** Hansmann, G. H. and Berne, C. J., *Arch. Surg.*, 1932, 25: 1090.

The histogenesis of this type of tumour is still vague in the reported cases. The authors report a case which occurred in a female child of one month, present from birth, and since then had doubled in size. The tumour was located at the lower end of the spine, but was not continuous with the sacrum or the coccyx. This was removed. It extended well anterior to the sacrum. During the dissection a well formed portion of bowel was found closely applied to the tumour, which was part of the mass, and separated from the peritoneal cavity by a thickened pelvic peritoneum. The tumour was both solid and cystic and contained small fragments of cartilage, accumulations of lymphoid tissue, well formed nerves and Pacinian corpuscles.

It is difficult to accept the explanation, that the histogenesis of these tumours is usually considered to be the independent development of a blastomere during segmentation of the ovum or the development of a misplaced ovum. A more likely cause is disorderly growth of tissue in the presacral region much later in fetal life. On this basis the embryological structures recurring in this region, in the hind gut, in the proctodeal membrane and in the neurenteric canal, are sufficient to account for the varying types of tissue occurring in these tumours.

G. E. LEARMONTH

**Notes on the Injection Treatment of Internal Hemorrhoids.** Sacks, G., *Brit. M. J.*, 1933, 1: 313.

The most satisfactory solution to use is a 5 per cent phenol in oil. Sloughing and secondary hemorrhage do not occur, as the phenol in oil is injected above the pile-bearing area. The author prefers sweet almond oil as the diluent. It is wisest to inject at weekly intervals. The total number of injections varies with the case.

It is advisable at the end of the treatment to ask the patient to return in one month. One further injection at this stage will often consolidate a cure. In bad cases recurrences are more frequent than with operation. Recurrences are still amenable to treatment by injection.

Angry red prolapsed piles should be treated by rest, with alternate hot and cold applications. When conditions have become normal injections will give good results. A bleb which does not whiten the mucous membrane should be formed by the injected solution. Injections should never be carried out in the acute stages. Fissure is a contraindication to injection. It is preferable in many cases to treat the fissure only at operation. The piles can subsequently be treated by injection. Skin tags interfering with cleanliness must be excised.

STUART GORDON

### Obstetrics and Gynaecology

**Prolonged First Stage of Labour.** Brown, R. C., *J. of Obst. & Gyn. of Brit. Emp.*, 1933, 40: 240.

The treatment of 360 patients, in whom the first stage of labour had lasted 30 hours or more, is discussed. These cases fall into two classes, (1) those in whom membranes have remained intact until complete dilatation and (2) those in whom membranes have ruptured early in labour.

The ultimate prognosis for both mother and child in Group 1, is good; for a vertex presentation without disproportion may be anticipated. One hundred and twenty-seven cases fell in the second group, but here the outlook is more grave; since early rupture of membranes is so often associated with disproportion and abnormal uterine action. Posterior position of the occiput with extension may cause relative disproportion; however, when uterine inertia is added, low Cæsarean section may be necessary. In many of these cases, the cervix is not drawn up and becomes nipped between the head, and the brim, thus increasing the obstruction. A bag may serve as an artificial dilator and relieve pressure on the child's head, but it will not influence the withdrawal of the cervix. A balloon is described which allows the introduction of saline into the amniotic cavity, supplying the fetus with artificial liquor and so relieving it from compression.

E. PERCIVAL

### Urology

**Specificity of Pathogenic Infections of the Kidney.** Beacham, H. T., *J. Urol.*, 1933, 29: 197.

A summary of reports would tend to show that infections of the kidney are probably sec-

ondary to some previously existing focus, and that *Staph. aureus* and *B. coli* are the most frequent offenders. Israel was the first to describe suppurative foci in the kidney secondary to a furuncle of the skin. This was in 1890, and since then such observations have been frequently repeated, but it has also been shown that moderate numbers of organisms may be present in the circulation without producing lesions. Brewer showed that if in such cases resistance were lowered by trauma to the kidney, lesions at once developed. Similarly it has been shown that the introduction of virulent cultures into the healthy bladder produced no lesions there or in the upper tract, but if retention be present serious infections result. In these cases of ascending infection the lymphatics have been shown to be as important as the ureter as the avenue of approach. A marked connective-tissue change was noted in rabbit's kidneys following the injection of uranium nitrate and living colon bacilli and a similar observation was made independently using uranium nitrate and *Staph. aureus* vaccine. The changes consist in fibrosis, round-cell infiltration and destruction of glomeruli.

The specific reactions to different types of organisms were studied by Duval and Hibbard, who used *Strept. scarlatinae* toxin and produced a glomerular nephritis in the dog and rabbit exactly similar to that seen in human beings. Crabtree maintains that cocci are excreted by glomeruli and bacilli by the tubules, since cocci cause cortical infections and bacilli usually cause medullary infections, but it is doubtful if bacteria are excreted at all unless pathological changes are present.

In undertaking a further study the author used *Staph. aureus* and *B. coli* because they are the organisms most frequently encountered in kidney infections. Of 500 specimens obtained during cystoscopic examinations he found colon bacilli in 28 per cent and *Staph. aureus* in 15 per cent of the cases. The organisms used in the experiments were obtained from surgically removed kidneys, in order to obtain, if possible, a specific organism. They were cultured and injected into the renal arteries of dogs in varying doses. Chills and febrile reactions were noted in each case, the severity depending to a certain extent upon the dosage, but, as in human beings, there was also a marked variation depending upon the individual resistance.

Corroborating previous experiments, it was found that staphylococci produced after twenty-two hours cortical abscesses of the kidney. In all cases the organisms had disappeared from the glomeruli and tubules by the end of six days. In animals which lived longer than ten days a regenerative process had begun. However, the connective tissue changes were much more marked following the injection of colon bacilli. The early fibrosis in the latter cases was a most interesting feature. In one animal,

sacrificed on the sixteenth day, a marked chronic interstitial nephritis was present. Advanced glomerular degeneration of the distal tubules followed the injection in the majority of cases. Although it appears that the organisms are not excreted by the tubules, their toxins are destructive to the distal tubular cells. Except in very large doses *Staph. aureus* affected only the proximal tubules.

N. E. BERRY

**Melanuria.** Blackberg, S. and Wagner, J. O., *J. Am. M. Ass.*, 1933, 100: 334.

This is a treatise on the relative occurrence of melanuria, with a review of 50 cases of melanotic malignant growths occurring in the Presbyterian Hospital, and the introduction of a more specific test for melanogen in the urine.

It is interesting to note that in those diseases in which there is excessive production of melanotic pigment melanuria was demonstrated in only 25 per cent of cases, and this again only occurred in those which showed metastatic involvement of the liver by the melanotic growth. These results corroborate a statement made by Eppinger in 1910, that only where there is a metastatic growth of the liver does melanin occur in the urine.

The test is as follows: (1) A twenty-four hour specimen of urine is evaporated to one-quarter the original volume. (2) One grm. of potassium persulphate is added for each 100 c.c. of concentrated urine. (3) At the end of two hours an equal volume of absolute alcohol is added. The precipitated melanin is allowed to settle. (4) The precipitate is filtered off and washed with water until the washings are colourless, then washed with methyl alcohol to remove any soluble pigments remaining. Finally it is washed with ether.

If the test is positive there remains on the filter paper a brownish black precipitate which can be dissolved off with alkaline (most conveniently 5 per cent sodium hydroxide). Acidification of the alkaline solution with tenth normal hydrochloric acid causes re-precipitation of the melanin. The quantitative excretion for 24 hours can be estimated by weighing the dry precipitate.

V. J. BERRY

### Orthopaedics

**The Treatment of Spinal Injuries.** Jefferson, G., *The Practitioner*, 1933, 3: 332.

In late years there has been a great increase in efficiency in the treatment of spinal injuries. With present day procedures, it is now possible to reduce the displacements with a considerable degree of success. It is also known that a fairly large proportion of spinal fractures may occur without any nerve involvement. The most common type of lesion is the crush-fracture of the first lumbar vertebrae. Kummel's disease is, un-

doubtedly, the result of an unrecognized crush-fracture. This was first described before the use of x-ray and at a time when every fractured spine was thought of necessity to have a degree of paralysis. Even at the present time a number of compression fractures are not diagnosed and the author stresses the necessity for dependable lateral x-ray pictures. The lesion is more likely to be missed if one relies entirely on antero-posterior plates, particularly if it is accompanied by fractures of the transverse processes. These spinal injuries may be classed as dislocations, pure fractures, or fracture-dislocations. They are all caused by sudden hyperflexion or some variation of it, and appear most frequently in the more mobile portions of the spine. Dislocations occur only in the neck, and the compression fractures most commonly at the thoracolumbar junction. Fracture-dislocations are observed when the force not only flexes the spine but has a traversing momentum, so that displacement of the fragments occurs. Spinal cord injury is inevitable in these latter cases, but not all of them are hopelessly paralysed.

Two series of cases are quoted to show the incidence of paralysis. In 50 cases admitted to the Salford Royal Hospital, 23 were uncomplicated by cord damage. A large series recently reported by Galdini and Gianelli showed that 53 per cent had no nervous symptoms, and only 27 per cent were totally paraplegic. Surgical opinion generally concedes that laminectomy has a limited place in the treatment of spinal injury, but none at all in the early stages. The patient with a spinal injury is best treated by endeavouring to reduce the deformity without any special reference to the cord injury. Crushing injuries occurring in the cervical region are never as marked as those of the first lumbar vertebra. They are best treated by immobilization in plaster of Paris. The amount of displacement present in dislocations, as demonstrated by the x-ray, is no indication of the amount of damage done to the cord. Dislocations should be reduced. There are two methods of treatment—that of Cotton and Taylor and that of Böhler. The former can give brilliant results if done very early. The latter procedure is described by the author.

A firm pillow is placed beneath the shoulders to hyperextend the neck, and a halter grasping the chin and the occiput is applied and fastened to the head of the bed. The head of the bed is raised on to the bedside locker. This gives powerful extension, and it is necessary to give the patient morphine to enable him to stand the discomfort. An hour or less of this treatment should be sufficient to secure reduction, which is checked by a portable x-ray machine. If the position is satisfactory the bed is lowered on shock blocks and the traction kept up for a period of 72 hours. This is followed by a plaster of Paris collar, holding the head in the same position, and the patient is allowed up. The

collar is worn for 6 to 8 weeks, when it is removed and exercises are begun. The patient may go home in the interval between getting up and the removing of the collar, but it is necessary for him to return for its removal and the carrying out of the exercises.

The compression fractures are treated by hyperextension. The spine may be considered to be made up of two columns of bone fused together. The anterior is composed of the cancellous bone of the vertebral bodies and the posterior is the compact bone of the neural arches and articular facets. The severe flexion causes a collapse of the body through the pivotal points formed by the articular processes. The idea of the hyperextension is to reduce the deformity through the same pivotal points. The method was first described by Davis, of Erie, and introduced into England by Watson Jones, of Liverpool. Jones also suggests that ambulance men should be trained to carry these patients face down to prevent further flexion. Davis secures his hyperextension and traction by anaesthesia and then hoists up the feet and ankles by means of a pulley. He then applies a plaster of Paris shell to secure his fixation. Jones uses morphine, and raises the patient's shoulders, and then applies a plaster jacket. The author thinks the Jones' method is somewhat simpler and describes it. Two tables are arranged, one about a foot higher than the other. The patient is suspended between these tables without any support. The arms and upper chest rest on the higher table and the thighs on the lower. This procedure is preceded by an injection of  $1/4$  or  $1/3$  of a grain of morphine. The hyperextension increases as the patient hangs and while the jacket is being applied. The author in addition to the morphine uses a paravertebral block of 1 per cent novocaine. The patient is allowed out of bed in a week and exercises are started to keep the muscles in tone and to improve the patient's morale. It is better to keep these patients under observation during treatment than to allow them to go home where they are most likely to become chronic invalids under the influence of sympathetic relatives. In cases in which a considerable degree of paralysis exists the plaster shell is preferred.

F. H. H. MEWBURN

### Ophthalmology

**Primary Non-Pigmented Sarcoma of the Lid.**  
Gabrielides, C., *Ann. D'Oculistique*, 1932, 169: 593.

Primary sarcoma of the lid is a tumour rarely seen. Very often it appears in the orbit itself or in the neighbouring skin of the lids with secondary development in the tissue of the latter. Reports of primary sarcoma of the lids are rare in the literature. Gabrielides reports a case of involvement of left lower lid in a male of 50 years who had neither hereditary nor acquired

disease. The growth appeared spontaneously without any predisposing cause, and developed rapidly. An excellent therapeutic result was obtained by means of x-ray therapy, but three months and a half later, the patient died from liver metastasis. Details of the case and therapy are given, and also a historical account of former reports beginning with Desmarres 1851, Mackenzie 1856, and Deval 1862. There are two illustrations.

S. HANFORD MCKEE

**Annular Interstitial Infiltration of the Cornea in Malignant Lymphogranuloma.** Lagrange, H., *Ann. d'Oculistique*, 1932, 169: 188.

There are three peculiarities in the nature of this condition, which should be emphasized: (1) Its great rarity. This is the first case which the author has personally observed. Also its semeiological peculiarities are striking (annular organization, successive growths, and comparative inactivity). (2) The existence of a deep limbus neo-vascularization, with infiltrated growth, which would naturally make us think that this corneal lesion ought to be composed of Sternberg cells, the origin of which, being reticulo-endothelial, are very much the same. (3) The action of radiotherapy of the progress of the lesion, which confirms what we have said on radio-sensibility of specific cells of malignant lymphogranuloma.

S. HANFORD MCKEE

## Neurology and Psychiatry

**Psychiatry and General Medicine.** McLean, F. C., *Mental Hygiene*, 1932, 16: 577.

Psychiatry, late in participating in the general advance of medicine during the past century, is now perhaps advancing more rapidly than any other branch of medicine. Naturally, this advance is not a uniform one, but there is little doubt that the new movement in psychiatry is having a profound effect upon the practice of medicine. The key to the changes is seen in the altered attitude towards the neurotic patient and it is in this field that the psychiatric attitude is of greatest value to those not practising that particular specialty. The neurotic must in every way be treated as is any other type of sick patient. His sufferings are just as real and just as far beyond his control as in any organic disease, and treatment is just as sorely needed. The typical neurosis may be considered as the resultant of three factors—the constitutional, the environmental and the psychological.

Of the first of these factors little can be said with certainty though it is obvious that there are marked individual variations in the response to the varied problems of life. The influence of hereditary and biochemical factors is however beyond dispute. Environmental factors are of great importance in the influence they exert on

emotional attitudes. Individuals who might otherwise lead happy useful, productive lives may be driven into a neurosis by intolerable environmental influences, be that stress due to family, economic or competitive factors. Again, it is probable that, regardless of the situation, there may exist a constitutional tendency towards an unhealthy, neurotic type of reaction. It is not the abstract situation but the fact that the situation in question is too much for that particular individual.

Lastly, and most important, the psychological factors. For our present understanding of these we are largely indebted to Freud and his insistence on the dynamic aspect of mental mechanisms. Though not accepted by all, certainly the majority of psychiatrists hold that the essence of neurosis lies in frustration, some active dynamic wish, conscious or unconscious, which cannot be gratified by the particular patient in his particular life setting. It has been well said that all persons are potential neurotics, and, further, that all at times show a neurotic type of behaviour. It is here worth emphasizing that the presence of organic disease does not exclude the presence of an important neurotic factor. The author analyzed 100 consecutive cases admitted to the out-patient department of the University of Chicago Clinics and found: (1) 53 patients with clearcut organic disease (neurotic concomitants if any ignored); (2) 23 patients with questionable organic disease (various "functional" disorders, colitis, etc., included); (3) 27 patients clearly neurotic.

It is obvious, then, that the neurotic presents a major problem in the medical department at least—a problem not as yet adequately met. The reason for the present faulty attitude of many physicians the author attributes to the fact that the physician, adequately trained in the organic diseases, is almost entirely unacquainted with the psychological factors, and his inadequacy is reflected in his handling of such patients, varying from making light of their symptoms to downright abuse. Until the same sympathetic and intelligent consideration is given to functional as to organic disorders the patient loses much of the service he is entitled to at the hands of his physician.

Granting this to be an adequate statement of the problem, what is the solution? It lies of course in the better training of the medical student in the handling of the various types of neurosis; in the adoption by the clinician of a better informed and more sympathetic attitude towards neurotics; in recognizing the importance of the environmental factors which the family physician knows better than any, and in assisting the patient to know himself better and handle his problems in a more mature and healthy fashion, and, lastly, in the closer cooperation between clinician and psychiatrist than is usual at the present time. Extensive efforts

along these lines may bring great advances in the treatment of that hitherto somewhat neglected problem which involves all branches of medicine—the neurotic.

G. N. PATERSON-SMYTH

### Therapeutics

**The Control and Complete Remission of Polycythæmia Vera following the Prolonged Administration of Phenylhydrazin Hydrochloride.** Giffin, H. Z. and Allen, E. V., *Am. J. M. Sc.*, 1933, 85: 1.

The authors report their experience with 37 patients suffering from polycythæmia vera, treated by means of phenylhydrazin hydrochloride. The treatment as a rule consisted of an initial course of 0.1 gm. of the drug given two or three times daily until from 3 to 4 gm. had been administered. A very small weekly maintenance dose of the drug was required thereafter to keep the patient's blood normal. This maintenance dose varied from 0.1 to 0.4 gm. It is pointed out that the drug, when administered daily, has a cumulative effect and hæmolysis proceeds actively for several weeks after the drug has been stopped. Care must therefore be exercised in administering the initial course of treatment which brings the erythrocytes to a more or less normal level. The authors are of the opinion that the drug also inhibits erythropoiesis, in spite of its stimulating effect upon leucocytes. Cases have been followed from two to four years. Some of these patients have been able to dispense with the drug entirely and maintain a normal number of red cells. Other patients have found it necessary to take the regular weekly dose or even at times to resort to temporary daily doses. In a few cases complete remission has occurred. As regards the toxicity of the drug to liver and kidneys, the authors were unable to demonstrate any impairment of the function of these organs after prolonged treatment—in one case after five years. However, they caution against too rapid initial reduction in the erythrocytes, as the excessive hæmolysis may be fatal in older patients with advanced visceral disease. They have been unable to show that patients develop abnormal tolerance to the drug. The same dose of the drug will have the same hæmolytic effect on a patient time after time, provided the erythrocyte level is the same each time a course of therapy is begun. It is suggested that the course of daily doses of the drug be administered while the patient is in the hospital under daily observation, and that the patient be allowed to go about in order to keep the circulation free and decrease the likelihood of venous thromboses.

E. S. MILLS

### Hygiene and Public Health

**The Chance of Dying from Angina Pectoris.** Statistical Bulletin, Metropolitan Life Insurance Co., 1933, 14: 5.

In common with other types of heart disease, angina pectoris has been increasing as a cause of death for more than two decades. The experience of the Industrial Department of the Metropolitan Life Insurance Co. illustrates this clearly and also shows statistically a fact which is well known, that males fall a prey to this condition more frequently than females. The figures are as follows:—

	1911	1915	1920	1925	1930
Males .....	24	30	33	52	77
Females .....	17	17	18	26	33

FRANK G. PEDLEY

**The Influence of Respiration and Transpiration on the Ionic Content of Air of Occupied Rooms.** Yaglon, C. P., Benjamin, L. C. and Brandt, A., *J. Indust. Hygiene*, 1933, 15: 8.

For some time suggestions have been made that possibly the ionic content of the air may have some relationship to feelings of comfort or to the quality of the ventilation. Just what this relationship is has not been defined. About a year ago the authors published a paper in "Heating, Piping and Air-Conditioning", in which they described a definite reduction in the number of ions in the air in rooms which are occupied by people. The present paper is an expansion of the earlier one. The method used in the determination of the ionic content is described and is somewhat technical.

The determinations recorded in the article confirm those already published, namely, that a marked reduction in the ionic content of the air occurs rapidly in rooms where a number of persons are congregated. To restore the normal ionic content means the introduction of huge amounts of outside air, which would not be practicable. The only feasible way of maintaining or increasing appreciably the number of ions in the air is by an artificial method.

It would seem probable that clothing is the important factor in reducing the ionic content. Expired air is practically devoid of ions, but the amount of air breathed in relation to the total air volume in a room is so small (0.35 cubic foot per minute per person) that respiration can hardly be responsible for the rapid reduction. Whether the presence or absence of free ions in the air bears any relation to comfort or health is extremely uncertain.

FRANK G. PEDLEY

## Obituaries

**Dr. Ernest Hamilton White**, of Montreal, chief of the department of oto-laryngology at the Royal Victoria Hospital and professor of oto-laryngology at McGill University, passed away on June 15, 1933, in the Ross Memorial Pavilion in his 55th year. Although he had been suffering from illness during the past two years, Dr. White had been up and about until ten days before, when he experienced a relapse that placed him in a weakened condition from which he did not recover.

E. Hamilton White, B.A., M.D., C.M., F.A.S.C., was born in Montreal on August 18, 1878, the youngest son of Richard and Jean (Riddel) White. He received his early education at Montreal High School, and then entered McGill University where he graduated with his Bachelor of Arts degree in 1899, and his medical degree two years later.

For two years Dr. White was a resident surgeon in the Montreal General Hospital. Then he began a general practice which he followed for four years, devoting some of his time to the throat clinic of the Royal Victoria Hospital and to pathological work. He decided to specialize in ear, nose and throat work, and went to Vienna, Freiburg and Basle. During this period he had the opportunity to study the work of Killian in nasal surgery and ear work with Professor Nager.

Dr. White then returned to Montreal and soon afterwards received an appointment to the staff of the Royal Victoria Hospital as clinical assistant. Since then he has risen in his chosen profession both at the hospital and at McGill until two years ago when he achieved the chairmanship and professorship respectively. He was appointed assistant oto-laryngologist at the hospital in 1920, and in November, 1930, he succeeded Dr. H. S. Birkett as chief of the department of oto-laryngology.

This department was organized originally under Dr. Birkett with the nose and throat sections under his direction. The late Dr. Frank Buller was in charge of the eye and ear departments. On the latter's death, the eye department was separated from the others and Dr. Birkett was placed in charge of ear, nose and throat. It was upon Dr. Birkett's retirement that Dr. White took over this work, but shortly thereafter he was taken ill and from that time he was able to do almost no active work.

At McGill, Dr. White started as demonstrator in oto-laryngology and rose to the rank of full professor. He was named an associate professor in 1928 and full professor in August, 1931.

He has been a contributor to the literature of his profession and was widely known as writer and teacher. He was a member of the Royal Society of Medicine, London, England, and also a member of the special sections of otology and laryngology of this society. He was also a member of the American Academy of Ophthalmology and Otolaryngology, and a Fellow of the American College of Surgeons.

He is survived by two brothers: W. J. White, K.C., and Senator Smeaton White; and by three sisters, Mrs. C. J. Hodgson, Miss Agnes E. White, and Mrs. C. A. Peters.

### SIR ARTHUR CURRIE'S TRIBUTE

The death of Professor Hamilton White of the Department of Otolaryngology of McGill University will be received with feelings of sincere and intense regret by his colleagues in the University and by a host of former students, among whom he was always very popular and very highly respected. Graduating as a Bachelor of Arts at the comparatively early age of twenty-one, and two years later as Doctor of Medicine, followed by a period of study abroad, he has given devoted service to his Alma Mater for many years, particularly in his chosen field of endeavour. He possessed a gifted pen, and by his writings contributed much to the knowledge of his subject, while his membership in many scientific

societies brought him into intimate relationship with specialists throughout the world and won for him an enviable reputation. But it was his charming personal qualities that will arouse among countless friends a deep sense of personal loss. Kindly, courteous, affable and sympathetic, he possessed to an unusual degree the gift of friendship. Students looked upon him more as an elder brother than as a teacher, and unhesitatingly shared with him their difficulties, firm in the knowledge that he would make their troubles his own. Deeply sensible of her own great loss, McGill University extends to the surviving members of his family her heartfelt sympathy.

### PROFESSOR H. S. BIRKETT'S APPRECIATION

It was my privilege and pleasure to have known the late Dr. E. Hamilton White from the days of his youth and more intimately since he entered McGill University, and when he later became associated with the Department of Oto-Laryngology in the Royal Victoria Hospital, where he was my senior assistant for fifteen years. During this period of friendship I had continual opportunities of appreciating his many fine qualities.

After an excellent medical career at the University he held a position as a House-Surgeon in the Montreal General Hospital for two years, and then spent one year in general practice. Having thus established a good foundation of general medicine, he then decided to take up the specialty of ear, nose and throat. He entered upon this new field with the thoroughness that always characterized his work; and after eighteen months spent abroad studying this specialty he returned to take up a position in the Royal Victoria Hospital and the University, equipped with a training well qualified to ensure the sound technique and good judgment of his work of later years.

He was conscientious in his duties as a colleague, unexcelled as an operator, and his judgment was conservative and sound. His genial qualities of friendship won him the affection of his colleagues and many other friends, to whom his passing is a great loss. They will always remember his charming personality, his unfailing gaiety and good humour, and his many acts of kindness.

H. S. BIRKETT

**Dr. Arthur Thompson Emmerson**, of Goderich, Ont., suffered a heart attack and died on June 2nd. Dr. Emmerson was born in Otonabee Township, near Peterborough, 75 years ago. He was educated at Peterborough Collegiate and the University of Toronto, and on graduation in 1889 practised medicine for a time in Peel County. Thirty years ago he established a practice in Goderich and was successful. He was an ardent educationist, a member of and at the time of his death Chairman of the Board. He was a Mason, a United Churchman, a member of the Session and founder and President of the Men's Club of North Street Church. John and Thomas Emmerson, of Peterborough, and James, of Port Arthur, are surviving brothers. He was also a member of the Council of the College of Physicians and Surgeons of Ontario from 1911 to 1924, and, during 1919-1920, was President of the same. His wife, formerly Miss Mary Coe, of Peterborough, died three years ago.

**Dr. Alexander Benjamin Fairfield**, of Beamsville, Ont., died on May 19, 1933. He was born in 1900 and graduated from the University of Toronto in 1926.

**Dr. James Galloway**, Beaverton, Ont., died on June 29th at the age of 78. He was born in Thorah Township 78 years ago, and was educated at Rockwood Seminary, Port Perry High School and Toronto University. He graduated from the University of Toronto in 1888, a medallist of his year, and settled in Beaverton, where he practised until ill health caused his retirement several years ago. His wife predeceased him in 1922. He is survived by three daughters: Miss Jenny and Miss

Annie, at home, and Mrs. Harold Cave, Uxbridge; and by a sister, Miss Elizabeth Galloway, Beaverton.

**Dr. James Wilson Groves**, of Ottawa, died on April 25th in his 83rd year. He graduated from the University of Toronto in 1878.

**Dr. Donald J. McIntosh**, of Vankleek Hill, Ont., died on June 9, 1933, in his 88th year.

The late Dr. McIntosh, familiarly known to all as "Doctor Dan" was the "Grand Old Man" of Vankleek Hill. He was born in 1846 in the village of L'Orignal, the son of James McIntosh, one of the early tailors who came out from Scotland to work among the pioneers of a new land.

Dr. McIntosh received his primary education at L'Orignal, later entering McGill to take up medicine. In 1870, after a brilliant medical course, he graduated and immediately set up practice in Vankleek Hill, there he had continued down through the years without interruption until about 10 years ago, when he retired.

He served his community in the capacity of medical health officer for forty-one consecutive years. He also served for a few years as a member of the public school board and chairman of the collegiate board, and gave of his time and unusual talents generously in the cause of civic and community advancement.

Dr. McIntosh was married twice, his first wife being Miss Cameron of L'Orignal. He later married Miss Eleanor Keough of Vankleek Hill, who predeceased him in 1926. He also was predeceased by two sons, Dr. Frederick McIntosh and Dr. James McIntosh, some years ago.

He is survived by four sons, Dr. Donald R. McIntosh of Blind River, Ont.; Dr. William T. McIntosh and Peter F. McIntosh, both residents of Toronto; John C. McIntosh, of Vankleek Hill; and five daughters, Georgia, of Montreal, Beatrice, of Peterborough, Margaret and Eleanor of Ottawa, and Jean, of Vankleek Hill.

**Dr. Herbert Carl Martin**, of Hamilton, Ont., died on May 3rd. He was born in 1889 and graduated from McGill in 1915.

**Dr. Simeon H. Martin** died recently at his home in Montreal, suddenly after a game of golf. He was in his 66th year.

Dr. Martin was born in North Shefford, Quebec, in 1868, and received his education at the Waterloo High School, later graduating from McGill University in 1892. He entered general practice in Waterloo, later coming to Montreal in 1913.

For many years medical officer of the 13th Scottish Light Dragoons, Dr. Martin was one of the best rifle shots in the Eastern Townships. He was mayor of Waterloo for some years. He was a 33rd Degree Mason and belonged to the Heather Curling Club and Hampstead Golf Club.

Surviving are the widow, Caroline Jameson; two sons, Dr. S. Jameson Martin, and Albert H. Martin, both of Montreal; two sisters, Mrs. E. F. Slack, and Mrs. C. W. H. Rondeau; and one brother, Marcus C. Martin, all of Montreal.

**Dr. Joseph-Octave Rhéaume** died on June 12th at Windsor, Ont., after a long illness. Dr. Rhéaume was born in the canton of Anderson in 1856. He studied at Windsor and at the College of the Assumption. He received his M.D. at Michigan (1885) and M.D., C.M. at Trinity University in 1886. In 1902 he was elected to the provincial government and entered the Whitney cabinet in 1904. He took an active part for several years in the political life of the province.

**Dr. Oscar Teeter**, of Amherstburg, Ont., died at his home on June 19, 1933, after a long illness. He was born at Grimsby in 1867, was educated there, and graduated from the University of Toronto in 1893, prac-

tising at Amherstburg since then. He was a member of Council for several terms and Mayor in 1901. His widow and one daughter survive.

**Dr. Paul Trudel**, of Three Rivers, Que., died on June 18th at the age of 59. He had practised for 22 years at Ste-Geneviève de Bastican, and had lived for three years at Three Rivers. He graduated in medicine from the University of Montreal in 1896.

**Dr. Stephen Archibald Wilkinson**, Chapleau, Ont., died on May 14, 1933. He was born in 1866 and graduated from Queen's University (M.B., 1914; M.D., 1920), Kingston.

**Dr. Arthur Isaac Willson**, for 41 years a resident of Plattsville, died at his home at New Hamburg, Ont., on June 17, 1933, after a prolonged illness. Born near Kitchener in 1864, he was the youngest son of the late Isaac and Mary Willson. He attended Kitchener Collegiate and Model School, and after several years of teaching resumed his studies at the University of Toronto, graduating 1888 with the completion of his medical course.

Dr. Willson was a very busy country practitioner, and before hospitals became numerous did much surgery in the country homes. He had taken several post-graduate courses and always kept abreast of the advances in the profession. He was a member of the Oxford County Medical Society, the Ontario Medical Association, and the Canadian Medical Association. His wife, who was Ada Perry of Woodstock, and a son and daughter survive. An elder son was killed in France. Dr. Willson was a member of the United Church, a Mason, an Odd-fellow and a Forester, and in politics a Liberal with very independent views. He was buried in Chesterfield Cemetery with hundreds of his old patients present to mourn his passing. Six physicians acted as pallbearers.

## News Items

### Alberta

The Legislative Commission which has been investigating the subject of health insurance has made the deduction that it would cost this province about \$12.29 for each inhabitant. For the medical care alone it would cost \$4.34 for each inhabitant. It would mean much to the physicians if the Provincial Government decided to place this latter amount, for those on relief, in the hands of a special committee.

### British Columbia

In the June issue it was stated that the Vancouver General Hospital had, on representations of the Vancouver profession, decided to restrict outdoor treatment to patients referred by members of the profession. It should have been stated that this action was taken on the recommendation of the medical board of the hospital.

The War Memorial Hospital of Williams Lake has been able to balance its budget, and closed its fiscal year recently with no outstanding debts, notwithstanding that its capacity was doubled, two years ago. In view of existing conditions this is regarded as an excellent accomplishment, and the management of the hospital is to be congratulated.

Negotiations between the Vancouver Medical Association and the City Council of Vancouver over the cost of the city's indigents' medical care are continuing. It is hoped to arrive at some such understanding as was recently reached in Winnipeg.

On June 8th, the Vancouver Medical Association was able to entertain certain distinguished members of the profession, who were attending the Pacific Scientific Congress. Dr. T. Furuhashi, of the Imperial University of Japan, spoke, following the dinner, at the Shaughnessy Golf Club, on "Heredity of blood groups, and its application to forensic medicine." Dr. L. T. Ride, of the University of Hong Kong, also spoke, telling something of research on finger prints.

The Provincial Board of Health has called attention to the fact that considerable numbers of individuals in British Columbia are inadequately protected from small-pox. The experience of Vancouver, recently, when a small, but exceedingly virulent, outbreak occurred, and, still more recently, two cases of hæmorrhagic small-pox, in Victoria, are pointed to as evidence that vigilance should not be relaxed. The danger of the introduction of the disease is emphasized, as shipping plying to the Orient is a constant hazard. It is interesting to learn that a total of 9 cases, on three different ships, were recognized by the Federal Quarantine Officers at Williams Head.

C. H. BASTIN

### New Brunswick

The meeting of the Canadian Medical Association, at Saint John, has been completed. The attendance was satisfactory, 441 visitors having registered. This may not seem a very large registration for our National Association, but in view of the prevailing financial stringency and the great distances to be travelled in this great country of ours, we may feel satisfied with the display of interest exhibited by the members in attending this year's meeting. It is the sincere hope of the members of the Saint John Medical Society and of the New Brunswick Medical Society that our guests enjoyed their stay in the Maritimes as much as we enjoyed having them visit us.

The scientific papers were well received and this enthusiastic reception would indicate that the papers were of a high order. The attendance at the Council was exceedingly good. Although a little moisture was noted on one or two occasions, yet on the whole the weather conditions were excellent. We, in Saint John, hope that the Canadian Medical Association will visit us again before many years have passed.

Dr. R. J. Collins, Superintendent of the Saint John Tuberculosis Hospital, has announced his intention of doing post-graduate study in Great Britain for six months, beginning in September, 1933. During Dr. Collins' absence, Dr. A. Clark will be Acting-Superintendent of the Hospital.

The wedding of Dr. Albert T. Leatherbarrow, of Hampton, N.B., to Miss Annie DeMille, R.N., took place during the month of June in Trinity Church, Saint John. Dr. Leatherbarrow has for long practised in Hampton, and is one of the better known rural physicians in the province.

Dr. C. W. MacMillan, Medical Officer of Health for Saint John and Charlotte Counties, has recently returned to Saint John, having completed a course in public health work at the University of Toronto, where he received a diploma in public health. Dr. J. M. Cameron, who acted as *locum tenens* for Dr. MacMillan during his absence, has returned to his work as travelling tuberculosis diagnostician for the Department of Health of New Brunswick.

A. STANLEY KIRKLAND

### Nova Scotia

The Halifax Branch of the Medical Society of Nova Scotia held a special dinner meeting on Wednesday, July 5th, at the Nova Scotian Hotel at which Dr. Robert

Muir, Professor of Pathology of the University of Glasgow, was the guest of honour. The meeting boasted the largest attendance for the year. Professor Muir spoke on the cancer problem and discussed the various angles from which that subject should be approached. He very kindly invited questions from his audience at the end of his talk. During his stay in Halifax Professor Muir was the guest of Dr. R. P. Smith, who was a former pupil.

Dr. J. G. FitzGerald, Dean of the Faculty of Medicine, and Director of the Connaught Laboratories of Toronto University, after the meeting of the Canadian Medical Association at Saint John, N.B., paid a visit to the Medical School of Dalhousie University, and also to the officers of the Department of Health of the Province. His visit was much appreciated by those who came in contact with him.

The Registered Nurses Association of the Province held its annual session at the Public Health Centre of Dalhousie University from June 12th to June 17th. The first five days were devoted to lectures and discussions of various topics. Miss Edith Johns, Editor of the *Canadian Nurse*, lectured on "Administration and teaching in nursing schools." Dr. H. G. Grant spoke on "Public health problems." Dr. H. B. Atlee took as his subject "State medicine," and Dr. E. P. Brison, Professor of Psychiatry, spoke on technical problems. At the annual business meeting held on June 17th, Miss Anne Slaterry was elected President of the Association. A decision was taken to the effect that an inspector of nurses' training schools be appointed.

Plans for the establishment of vocational training at the Nova Scotia Hospital were made recently by Hon. Dr. G. H. Murphy, Minister of Public Health for the Province. Other features which added to the comfort of the patients of this hospital were also commented on.

N. B. DREYER

### Ontario

In an address before the Guild of Prescription Opticians, in Toronto, recently, Dr. Crawford C. McCullough, of Fort William, said that the time had come in the interests of honesty, if for no other reason, to institute a movement to combat the growing exploitation of the public and its health with respect to eye examinations and the corrections of visual defects. He emphasized the need of bringing home to the public the prime necessity of safeguarding health by using the combined services of an eye physician and a dispensing optician. The physician, he stated, must and does assume complete responsibility for the treatment of his patient. When, in the course of an examination, he finds it necessary to prescribe optical lenses for his patient, he and he alone should determine what those lenses should be. The physician must also be responsible for the accurate filling of prescriptions and this was the primary basis of that cooperative relationship which made the physician and optician each the necessary complement to the other in rendering complete and scientific service to the physician's patient and the optician's customer.

In discussing the paper Dr. Colin A. Campbell, Toronto ophthalmologist, declared that the big optical houses were responsible for establishing the impression among the public that the eyes could be refracted just as well by persons other than eye physicians. In his opinion no person should be allowed to refract a child under six years or even ten except a medical man. Dr. Campbell referred to the perils which come to patients who had been given glasses by persons who had failed to recognize glaucoma. He had known of patients who had gone blind before coming to an eye physician after having three pairs of glasses sold them the previous year.

The City Council of London, Ont., has approved the scheme submitted for the erection of a cancer clinic as a part of the Provincial Government cancer campaign.

The surgical instruments belonging to the late Dr. Hadley Williams, Professor of Surgery, University of Western Ontario, were donated by Mrs. Williams to the Queen Alexandra Sanatorium.

The University of Toronto Medical Class of 1892 held a reunion at the home of Dr. Harry Way, in Chicago, last month. Members of the class were present from Ontario, Manitoba, Michigan, Ohio, Illinois, Minnesota, Wisconsin and elsewhere. Dr. Frank Hagerman, of Milwaukee, was elected President for next year, when the Class will be the guests of His Honour, Colonel Herbert A. Bruce and Mrs. Bruce.

At the recent meeting of the National Tuberculosis Association (U.S.A.) held in Toronto, Dr. Stuart Pritchard of Battle Creek, Michigan, a graduate of the University of Toronto, was elected President. Dr. Pritchard is Director of the W. K. Kellogg Foundation. Dr. J. H. Elliott of Toronto, was elected a Director.

Recognized for his scientific work carried on in the University of Toronto, Dr. V. E. Henderson, professor of pharmacy and pharmacology, has recently been elected an honorary member of the Kaiserliche Leopold Carolinische Deutsche Akademie der Naturforscher. The professor was advised of this latest honour conferred upon him by the receipt of a diploma from the German academy, which he has gratefully accepted.

J. H. ELLIOTT

### Saskatchewan

Dr. Frank Schraeder, who for two years has been an interne at the Regina Grey Nuns' Hospital, was the guest of honour at a dinner at the Hospital when he was presented with a cheque on behalf of the medical staff. The fact that it was the hottest day of the season did not deter forty of the staff members from enjoying the dinner, making speeches expressing appreciation of Dr. Schraeder's work, and wishing him good luck as he goes on to the Montreal General Hospital for further work.

LILLIAN A. CHASE

## Book Reviews

**Handbuch der Unfallmedizin mit Berücksichtigung der Deutschen, Österreichischen und Schweizerischen öffentlichen und der privaten Unfallversicherung.** (Manual of Accident Medicine, with consideration of the German, Austrian and Swiss public accident insurance, and of private accident insurance). Dr. Constantin Kaufmann, Dozent University of Zürich. 5th ed., vol. 1, 862 pages. Price RM 52. Ferdinand Enke, Stuttgart, 1932.

This large volume is the first of two dealing with the medical and surgical problems involved in the treatment and after-treatment of injuries; with the influence of previously existing disease on accidents; with illness arising out of accidents; with diseases arising in connection with industry; and with the development of expert opinion. It is divided into two parts. The first is concerned with the development and significance of accident insurance and of accidental medicine. Terms are defined and the varied interpretations of the insurance acts of Germany, Austria and Switzerland contrasted. The relation of the doctor to public accident

insurance and his place in the scheme is discussed. The author states that it is not, in general, desirable to withdraw from the practitioner all of the more important accidents without regard to his personal ability to treat them. The tariff of medical and surgical fees is considered. A chapter is devoted to malingering, which is gone into in some detail. Considerable space is utilized in the consideration of compensation in industrial accidents, and there is a significant chapter on the making of the primary examination of the injury and filing report of the same, which may be all-important in making final decisions. The last chapter of the first part is concerned with the practice and problems of forming and giving expert opinion. The second and larger part of this volume deals with wounds and wound-infection and regional injury. Beginning with head injuries, each part of the body is systematically and minutely covered. Aid in appraising the injury is given in each case; numerous court decisions are included where they help to throw light on the problems involved.

The author is a surgeon of wide experience in insurance work, and a medico-legal expert of high standing. His book is highly recommended to those having to do with compensatable accidents.

**Clinical Endocrinology of the Female.** Charles Mazer, M.D., F.A.C.S., Assistant Professor of Gynecology and Obstetrics, Graduate School of Medicine, University of Pennsylvania, and Leopold Goldstein, M.D., Demonstrator of Obstetrics, Jefferson Medical College. 500 pages, illustrated. Price \$7.00. W. B. Saunders, Philadelphia and London; McAinsh & Co., Toronto, 1932.

The authors have covered the literature dealing with experimental endocrinology very well up to the middle of 1932. It is felt that the acid test of scrutiny was not applied to some of the data upon which the text was built. Since the physiology of the hypophysis has been much revolutionized during the past few months, it is regretted that a work representing such tremendous care and collaboration should appear prematurely.

**Der Wasserversuch als Nierenfunktionsprüfung.** Ferdinand Lebermann, M.D. 144 pages, illustrated. Price RM 11. Theodor Steinkopff, Dresden and Leipzig, 1932.

After briefly reviewing the different theories on kidney function, the author presents a modified water test for kidney function in various kidney affections. There are sections dealing with theories of water household technique, the water test in various kidney diseases, modification of the water test and the therapeutic value of the water test.

The subject matter of this book has been gathered after seven years of experience, is well arranged and easy to read, dealing in an up to date way with all phases of renal function. It should contain valuable information for the internist as well as the general practitioner.

**Diseases of the Skin.** The late Robert W. MacKenna, M.A., M.D., B.Ch., sometime lecturer in Dermatology at the University of Liverpool. Third ed., 506 pages, illustrated. Price \$7.50. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1933.

This edition has been revised and enlarged by R. M. B. MacKenna, M.A., M.D., B.Ch.(Camb.), M.R.C.P.(Lond.), M.R.C.S.(Eng.) son of the author. All the commoner diseases of the skin are adequately dealt with and treatment is laid down dogmatically, which from the general practitioner's point of view is desirable, but on the whole obtrusive egotism is avoided. A particular feature of the book is the very large number of excellent illustrations, there being no less than forty-five coloured plates in addition to the ordinary

black and white illustrations. This is a highly practical and inexpensive text-book which can be unhesitatingly recommended to the student and practitioner.

**The Mode of Action of Drugs on Cells.** A. J. Clark, B.A., M.D., F.R.C.P., F.R.S., Professor of Materia Medica in the University of Edinburgh. 298 pages, illustrated. Price \$4.50. Macmillan Co., Toronto, 1933.

This is a very interesting book, especially for the scientist, in which Clark sets forth the fallacies incurred in applying mathematical reasoning to pharmacological processes. He points out what type of reasoning is justified, and its limits. While valuable to the scientist, it would be of little value to the ordinary practitioner.

**Epidemiology in Relation to Air Travel.** Arthur Massey, M.D., D.P.H., Medical Officer of Health for City of Coventry. Pages viii and 60, five maps. Price 7s. 6d. net. H. K. Lewis, London, 1933.

The sanitarian has successfully tackled the problems of plague, cholera, yellow fever and malaria and their spread along commercial trade routes. The development of aerial travel brings new dangers and new problems. It has been established that the paths of infection from country to country coincide very closely with regular lines of human travel and pretty much at the speed of that travel. Aerial travel which brings India, West Africa and other endemic centres of disease within a few days travel of England (and the same holds true of the U.S.A. in relation to Central and South America) forces a consideration of the fact that an infected person may travel during the incubation period of his disease and land at a distant airport with his disease well developed or even before the onset of distinctive symptoms. New regulations for surveillance of passengers at and after disembarkation must be developed in case of travel from or through infected ports.

The established air routes through endemic areas of disease are outlined, with maps, and a basis for sanitary measures discussed. The disposal of excreta is dealt with, as well as methods for deinsectization and deratization, important procedures for overcoming the dissemination of vectors.

**Clinical Diagnosis, Physical and Differential.** Neuton S. Stern, A.B., M.D., Associate Professor of Medicine, University of Tennessee. 364 pages. Price \$4.20. Macmillan Co., New York and Toronto, 1933.

This is a student's manual for use while pursuing the study of clinical diagnosis. It has been prepared by the author as the result of eleven years of teaching of medicine and gives the methods used in his clinics. It is divided into four parts, the first dealing with history-taking and physical examination including instrumental and operative measures of diagnosis, the second with symptoms and signs in tuberculosis and heart disease, the third with the technique of diagnosis with a series of cases for diagnostic practice, and a closing part in which there is a discussion of principal signs and symptoms arranged in alphabetical order. One misses the usual illustrations of methods, technique and surface outlines but this is presumed to be taught in the class. It is a book which a teacher should review to decide whether it meets the needs of his method of instruction.

**Physical Chemistry of Living Tissues and Life Processes.** R. Beutner, M.D., Ph.D., Professor of Pharmacology, School of Medicine, University of Louisville. 337 pages, illustrated. Price \$5.00. Williams & Wilkins Co., Baltimore, 1933.

Dr. Beutner is primarily a physical chemist, and a pupil of one of the chief of living physical chemists, Fritz Haber. He is therefore pre-eminently fitted by his training to collect and present the results of the

various experiments, frequently of a fascinating nature, which have been made to imitate various natural processes of living organisms by non-living and controllable procedures.

The aim of the book is indicated by the author in the following passage: "Vital functions are analysed by means of the following steps: (1) the finding of suitable artificial models which reproduce certain phenomena peculiar to living organisms; (2) the study of the physical laws of the model, the observation of similar physical action in related models, hence a generalization of our physical knowledge of the entire field; (3) the application of these physical laws to biological problems; (4) finally, on the basis of all the experience gained, an extension of the experiences with models may be attempted." "Attempts at approach" are made, first through a study of osmotic and related forces at membrane surfaces, then by study of similarities between life processes and crystallization phenomena, and finally through the study of electrical currents in tissues. The presentation is reasonably simple; the author claims that the text of the book can be readily understood by the average medical student. The unusual medical student who has the courage to read through it will be well repaid by the stimulus to thought—sometimes unorthodox thought—which he will receive.

The book suffers, as all monographs written by enthusiasts must suffer, by occasional straining of conclusions, conclusions in this case applied perhaps sometimes unjustifiably from dead to living matter. Discounting this trend, and recognizing lack of complete balance, the book is nevertheless a mine of useful information which can be profitably employed by every teacher of physiology and biochemistry. The following are some of the varied subjects dealt with: vitalism, oedema, kidney function, the rise of sap, karyokinesis, the micellar theory of colloids, x-ray diffraction, models of cell respiration, tumour growth, amoeboid movement, narcosis, artificial parthenogenesis, and mitogenetic rays.

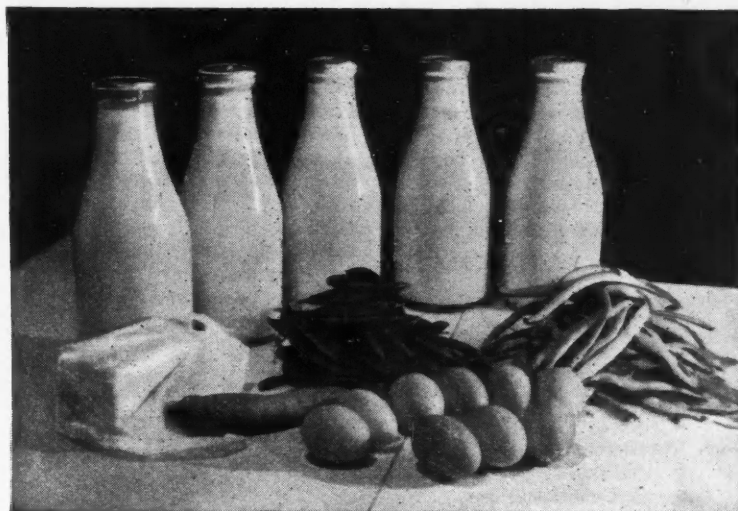
**Modern Aspects of Gastro-enterology.** M. A. Arafa, M.R.C.P., Medical Assistant to Guy's Hospital, London. 374 pages, illustrated. Price \$8.25. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1933.

The author of this book, after three years' study in the most important clinics of London and the Continent, has recorded his impression of modern gastro-enterology. In England he worked under Hurst, whose well-known theories regarding the pathogenesis, diagnosis, and treatment of peptic ulcer are again set forth here. In fact that portion of the book which deals with the stomach is practically a summary of Hurst and Stewart's "Gastric and Duodenal Ulcer" published in 1929, although the theories of Continental authors are stated where there is a difference of opinion.

It is in the chapters dealing with intestinal diseases, particularly in regard to dysentery, that the author's personal experience becomes evident. He does not accept Hurst's view that ulcerative colitis and bacillary dysentery have a common etiology, and his comments on the diagnosis and treatment of inflammatory lesions of the bowel will repay careful study. The chapters on the gall-bladder, pancreas, and the simulation of gastrointestinal disease, are also well done. Students and teachers should be interested in the sections on investigation and diagnostic methods which precede each division of the book.

**Surgical Operations.** E. W. Hey Groves, M.D., B.Sc., M.S., F.R.C.S., Consulting Surgeon, Bristol General Hospital. Third ed., 263 pages, illustrated. Price \$5.50. Oxford University Press, London; McInish & Co., Toronto, 1933.

The third edition of this well known surgical text-book for nurses exhibits no radical departures from its popular predecessors. The author has kept constantly



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in mind the fact that the chief requirements of the operating room nurse are a general knowledge of the surgical procedures to be undertaken and a more detailed knowledge of the instruments likely to be used and the routine sterilization and other technique of the operating room. A fairly complete, although not exhaustive, series of more common operations is described. The book is well illustrated and an extensive appendix illustrating and naming the various instruments commonly used by British surgeons enhances the value of this book to the nurse or intern.

**Endocrine Medicine.** The late William Engelbach, M.D., D.Sc., F.A.C.P., sometime Professor of Clinical Medicine, St. Louis University. Three volumes and index volume; 1,912 pages, illustrated. Price \$35.00 the set. Charles C. Thomas, Springfield and Baltimore, 1932.

The first thing which impresses one about this elephantine publication is its remarkable arrangement. In the first volume of "General Considerations," for example, the history of the pituitary is discussed in one chapter, the anatomy in another, the histology in a third, the embryology and the physiology separately elsewhere. In the second volume the pituitary re-appears in the first half under "infantile" and in the second half under "juvenile endocrinopathies," and turns up again in the two ("adolescent" and "adult") sections of the third volume. This system inevitably leads to an excessive amount of duplication of material, and makes it very hard to use the book for reference. The omissions are not less surprising. A paragraph in volume I, page 24, which is repeated almost word for word in volume III, page 760, confirms the statement of the preface that the suprarenal medulla, the pancreas, and the liver are not to be considered in this work. Addison's disease is also excluded (on the surprising ground that it is a medullary disorder), and Simmonds' disease receives only a very few pages, mainly of case-history. In short, the whole emphasis of the book is laid on abnormalities of skeletal development, genital development, or mental development. The pages bristle with "thyropituitarism" (which apparently is not to be confused with "pituitarothyroidism") and "hypergonadism" and similar sonorous labels for which there is frequently little logical justification. The best feature of the book is the elaborate series of tables of normal osseous development and the excellent accompanying roentgenograms. The material presented in these volumes, carefully sifted and written in a less turgid style, would have made an excellent speculative book of some 300 pages on normal and abnormal skeletal development. The preface pays tribute to the labours of a small army of secretaries, who apparently devoted themselves to the multiplication of material rather than to the elimination of misprints, misspellings, and contradictions.

**The Tides of Life, the Endocrine Glands in Bodily Adjustment.** R. G. Hoskins, Ph.D., M.D. Director of Research, Memorial Foundation for Neuro-Endocrine Research. 352 pages, illustrated. Price \$3.50. W. W. Norton & Co., New York, 1933.

In the preface, the author states "I have here attempted to present in brief form the more significant aspects of endocrinology as known to-day," and he has achieved his purpose most satisfactorily, for he has written in a clear and attractive manner a volume which will bring the reader up to date on this subject, and at the same time give him a conservative and sound view of what has been placed upon a scientific basis rather than on speculation. Beginning with a general statement, the book proceeds to devote a chapter to each of the endocrine glands. In these chapters, the structure and function is explained, followed by a description of the effects of abnormal conditions of each gland.

This is not a medical text-book, but the volume will be appreciated by medical readers who have

found this subject rather involved, with a terminology of its own, and who have looked for what might be described as a scientific presentation in non-technical language. The concluding paragraph on the thyroid gland is an example of this:—"This much we know. We are what we are in no small measure by virtue of our thyroid glands. Our development before birth and through infancy depends upon their functional integrity. The hurdles of puberty are taken with their aid. A pinch too little of thyroxine spells idiocy. A pinch too much spells raving delirium. By its very mobility the thyroid plays a major rôle in keeping us attuned to our environment. Nature has done much with the thyroid hormone. Can man, with growing intelligence, do more?"

**Diseases of the Nose, Throat and Ear.** Edited by A. Logan Turner, M.D., LL.D., F.R.C.S.E., Consulting Surgeon, Ear and Throat Dept., Royal Infirmary, Edinburgh, *et al.* Third edition revised. 465 pages, illustrated. Price \$6.00. John Wright & Sons, Bristol, Macmillan, Toronto, 1932.

Each section of this excellent text-book has been revised and parts have been rewritten, especially those dealing with peroral endoscopy and the Menière symptom-complex. The outstanding addition is a description of the physiology of the otolith apparatus and its relation to clinical investigation. A number of new illustrations have been added, including skiagrams of the paranasal sinuses, the steps of the Howarth operation on the frontal sinuses, the intranasal operations on the ethmoid cells, the anatomy of the pharynx, direct examination of the larynx, bronchi and œsophagus, diseases of the œsophagus, and the pathological changes in mastoiditis.

The chapters on the anatomy and diseases of the paranasal sinuses are contributed by A. Logan Turner, who has given in a concise form an excellent text on this widely debated subject. Dr. Gardiner contributes the chapter on diseases of the nose; Dr. Guthrie the section on the pharynx and naso-pharynx and Dr. Lithgow the chapters on the anatomy and diseases of the larynx. The section on endoscopy is written by Dr. Martin. The anatomy, physiology and diseases of the ear is written by Dr. Fraser.

This book, covering as it does the whole field of otolaryngology in a clear and concise manner, is not only excellent as a text-book for the use of undergraduates in Medicine and general practitioners but will also be of great assistance to men practising this specialty.

**Food and the Principles of Dietetics.** Robert Hutchison, M.D., F.R.C.P., Physician to the London Hospital, etc., and V. H. Mottram, M.A., Professor of Physiology, King's College of Household and Social Service, University of London. Seventh ed., pp xvi + 630. Price \$6.25. Edward Arnold, London; Macmillan Co., Toronto, 1933.

We have only praise for this new edition of Hutchison's "Food and the Principles of Dietetics." Appearing first in 1900, it has now reached its seventh edition and has had 15 reprintings of former editions. It is one of our most practical books in English on the subject with which it deals. With the assistance of his collaborator, Professor Mottram, the original author has been able to present a much rewritten book dealing not only with the composition and relative values of the foods in general use, with condiments, beverages, including alcohol and wines, but considering also the processes of preparation, cooking and digestion. The principles of feeding adults and children in health and disease are fully presented. A perhaps minor subject, but one of value to the physician, is a discussion of the relative food values and cost of various proprietary and patented foods which are extensively advertised and presented by commercial firms to the profession and to the public. A book of

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this type should be on the shelves of every student and practitioner for reading and for reference.

**Crimes and Criminals.** William A. White, A.M., M.D., Sc.D., 276 pages. Price \$2.50. Farrar & Rhinehart, New York, 1933.

This is not a collection of lurid stories calculated to appeal to the taste of those looking for thrills, nor is it a practical manual for police officers, lawyers, judges, etc. It would do all of them good to read it, however. Crime is one of the greatest of social problems, but no thoughtful person can feel comfortable in his contemplation of the progress made toward a solution. Present ways and means somehow have failed to produce satisfactory results. Dr. White very nearly deserves the qualification "venerable." For forty years he has devoted his life to psychiatry, and during at least the last score of years has been well in the forefront both as administrator and investigator. Naturally, in a career such as this, contacts with the current methods of dealing with crime have been many. In this book, intended to be semi-popular in type, he discusses clearly his views on the psychological background and nature of crime, and in a most persuasive way says what he thinks should be done about it. While his personal experience has been with American courts and procedure, much of what he says should be thoughtfully considered by those interested anywhere.

Over half the book is devoted to a careful presentation of the psychological activities underlying criminal behaviour. Coming down to the actual details of the problem, he feels that three objectives should be kept in mind in our efforts to improve methods, *viz.*, interest in, and investigation of the perpetrator of the act rather than of the act itself; decided modification or elimination of the concept "punishment," substituting for it the concept "treatment"; an immense improvement as to qualifications of police officers, gaol wardens, prosecuting lawyers and judges. There probably is no group

performing specialized social functions of which so little in the way of special training and preparation is demanded. He admits that his present views are pessimistic and his hopes almost utopian. With increasing knowledge and advanced leadership however, reasonableness should slowly supplant inefficient emotionalism.

The author, with his great experience and his capacity for clear thinking and logical exposition, has presented a broad reasonable survey of a most important subject.

#### BOOKS RECEIVED

##### **Compendium of the Pharmacopœias and Formularies.**

C. J. S. Thompson, M.B.E., Associate of Royal Academy of Medicine (Turin). Seventh edition, 381 pages. Price \$3.00. John Bale, Sons & Danielsson, London; Macmillan Co., Toronto, 1933.

**Arctic Safari, With Camera and Rifle in the Land of the Midnight Sun.** Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S., Fellow of the Royal Geographical Society, etc. 198 pages, illustrated. Price \$2.75. C. V. Mosby, St. Louis; McInsh & Co., Toronto, 1932.

**Simple Instructions for Diabetic Patients.** Dorothy C. Hare, M.D., M.R.C.P., Physician to Royal Free Hospital, etc. 20 pages. Price 1s. net. H. K. Lewis, London, 1933.

**Anatomy.** Part II. Fourth edition, revised by Charles R. Whittaker, F.R.C.S.E., F.R.S.E., Lecturer on Anatomy, Surgeon's Hall, Edinburgh. 68 pages. Price 1/6 net. E. & S. Livingstone, Edinburgh, 1933.

**Chinin in der Allgemeinpraxis.** Edited by Dr. Fritz Johannessohn, Mannheim. 176 pages. Published by Bureau for Increasing Use of Quinine, Amsterdam, Holland, 1932.

## The Treatment of Macrocytic Anaemias with MARMITE

Reports of clinical trials published recently (The Lancet, June 17th, 1933, p. 1283) afford striking confirmatory evidence of the hæmopoietic properties of Marmite.

Reference is made by the author of these reports to the successful results obtained by several other investigators who have used Marmite in various macrocytic anæmias—including the anæmia associated with coeliac disease and with sprue, as well as in true pernicious anæmia.

It is interesting to note that other yeast preparations and Vitamin B concentrates proved to be inactive curatively when tested on a

number of cases of tropical macrocytic anæmia, but that these cases all responded to Marmite treatment. This observation on the superiority of Marmite as an anti-anæmic agent is in agreement with the findings of workers in other fields (Archives of Disease in Childhood, April, 1933) and tends to show that Marmite is of even more value as a medicament than was recognized hitherto.

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